VOL. [illegible] JULY, 1936

THE PSYCHIATRIC QUARTERLY

Tuberous Sclerosis

[illegible]ociishness and Mental Puerilism

[illegible]e Treatment of a Severe Case of Alcoholism with Re[illegible]

[illegible] of Prepsychotic Personalities of Cycloid Types

[illegible]oses Associated with Hyper[illegible]

[illegible] Posttraumatic Central Nervous [illegible] Clinical Psychiatric Syndr[illegible]

[illegible] Environmental Factors [illegible] Praecox and Manic-Depr[illegible]

PUBLISHED AT THE [illegible]
UTICA STATE HOSPITAL, UTIC[illegible]

VOL. 10 JULY, 1936 No. 3

THE PSYCHIATRIC QUARTERLY

RICHARD H. HUTCHINGS, M. D., Editor

CLARENCE O. CHENEY, M. D., Associate Editor

PUBLISHED BY AUTHORITY OF THE
NEW YORK STATE DEPARTMENT OF MENTAL HYGIENE
DR. FREDERICK W. PARSONS, *Commissioner*

The Psychiatric Quarterly, formerly the State Hospital Quarterly, is the official organ of the New York State Department of Mental Hygiene.

Volumes begin with the January number. Annual subscription rate, $2.00.

Editorial communications, books for review and exchanges should be addressed to the editor, Dr. Richard H. Hutchings, Utica State Hospital, Utica, N. Y.

Business communications, remittances and subscriptions should be addressed to the State Hospitals Press, Utica, N. Y.

Entered as second-class matter April 17, 1917, at the postoffice at Utica, N. Y., under the Act of March 3, 1879.

TABLE OF CONTENTS

PAGE

Tuberous Sclerosis. By Armando Ferraro, M. D., and Glenn J. Doolittle, M. D. 365

Simulated Foolishness and Mental Puerilism in the Psychoses. By Pompeo Milici, M. D. 417

Report of the Treatment of a Severe Case of Pellagra and Alcoholism with Recovery. By Meyer M. Harris, M. D., Percy P. Poliak, M. D., and Joseph R. Blalock, M. D. 438

Treatment of Prepsychotic Personalities of the Schizoid and Cycloid Types. By A. J. Gosline, M. D. 454

Psychoses Associated with Hyperthyroidism. By Gerald R. Jameison, M. D., and James Hardin Wall, M. D. 464

Relationship of Posttraumatic Central Nervous System Pathology to the Clinical Psychiatric Syndrome. By Oswald J. McKendree, M. D. 481

Hereditary and Environmental Factors in the Causation of Dementia Præcox and Manic-Depressive Psychoses. By Horatio M. Pollock, Benjamin Malzberg and Raymond G. Fuller 495

Book Reviews 510

Charles Sherman Little 526

Notes 527

TUBEROUS SCLEROSIS*

(*Diffuse Neurospongioblastosis*)

BY ARMANDO FERRARO, M. D., AND GLENN J. DOOLITTLE, M. D.

FROM THE DEPARTMENT OF NEUROPATHOLOGY, NEW YORK STATE PSYCHIATRIC INSTITUTE AND HOSPITAL, NEW YORK, N. Y., AND CRAIG COLONY FOR EPILEPTICS, SONYEA, NEW YORK**

I. Introduction

Cerebral tuberous sclerosis was first described in 1880 by Bourneville[1] and Brissaud[2] who considered it as the expression of an inflammatory proliferation of neuroglia tissue. Since then numerous authors have described cases of tuberous sclerosis, some of them expressing their conception of the pathogenesis of the disease. Most of the earlier literature is found in Pellizzi's[3] article of 1901. At that period this author formulated the opinion that tuberous sclerosis is fundamentally the expression of an abnormal histogenesis of the cerebral cortex as the result of which the lamination is disturbed and some of the pyramidal elements substituted by atypical cells abnormally oriented. According to him, at a certain period of the brain development, because of the stimulus of unknown factors, a modification takes place in a more or less large group of neuroblasts, following which atypical nerve cells develop. The process may be more pronounced in some groups than in others and in some instances the modification leads to the formation of nodules. The process seems to develop somewhat late in the intrauterine period of life as the lesions do not involve the primary and secondary sulci, making their appearance after the formation of such sulci, which according to Kolliker is completed by the seventh or eighth month of intrauterine life.

In support of his idea, Pellizzi points out the fact that there are numerous large cells, the character of which is here and there of the embryonic type, recalling some of the embryonic elements described in gliomas. The disturbance in the orientation of the nerve cells in the various layers is considered by him as another argument in favor of a defective histogenesis. In addition, the presence of a

*The histological findings of four cases formed the subject of a preliminary report read at the meeting of the American Association of Neuropathologists, December 28, 1933.

**The clinical material related to the first 15 cases has been furnished by Dr. G. J. Doolittle. The clinical histories of the two last cases were kindly furnished by Dr. Ralph P. Folsom, superintendent of the Hudson River State Hospital.

large number of nerve cells in the white substance, points to a primary disturbance of distribution of cellular elements. According to Pellizzi the reaction of the neuroglia is secondary to the development of the nerve cells, the sclerosis representing therefore the end result and not the primary factor of the disease.

The process is labelled by Pellizzi "cortical disseminated histoatypia." The term disseminated neurogliomatosis, which he thought of, did not seem to him a suitable one.

In more recent years, Vogt,[4] Bielschowsky[5, 6] and his collaborators, Gallus,[7] Rose[8] and Freund,[9] Babonneix,[10, 11] Bonfigli,[12] Perusini,[13] Cavazzani,[14] Bolognesi,[15] Niewenhuijse[16] and in the very recent years, Freeman,[17] Desogus,[18] Brushfield and Wyatt,[19] Licen,[20] Bolsi, [21, 21a] Von Meduna[22] Yakovlev and Guthrie,[23] Critchley and Earl,[24] Mattirolo and Omodei Zorini,[25] Globus and Strauss,[26] et al., have investigated this problem and expressed numerous opinions as to the real significance of the pathological lesions.

Following the first interpretation of malformation advanced by Pellizzi, Bielschowsky expressed the opinion that tuberous sclerosis was to be classified as a spongioblastosis. Later on, in a further study, Bielschowsky modified his previous opinion and considered the disease a mixed one in which both a process of blastomatosis and a process of malformation were simultaneously at work. He therefore considered the condition as one of malformation plus neoformation.

In favor of the malformation theory of Pellizzi attention was called to the malformation existing in association with some of the cases of tuberous sclerosis: plagiocephaly, oval palate, dental anomalies, transposition of the large blood vessels, vascular hypoplasia, polypoid condition of the intestines, abnormal position of the caecum and of the appendix, genital agenesis, partial agenesis of the brain, congenital hydrocephalus, spina bifida, heterotopia of nerve cells, etc.

On the other hand, neoformations have been reported in various organs in most of the cases, heart: rhabdomyoma; kidney: hypernephromas, mixed tumors with cystic formation; skin: papillomas and adenoma sebaceum. Both malformations and neoformations seem to involve mesodermic and ectodermic structures.

For many years the majority of the authors have accepted either the conception of Pellizzi or of Bielschowsky, the number in favor of Pellizzi prevailing, however, over the latter.

In 1926, Mattirolo and Omodei Zorini, speaking of the neoplastic appearance of some of the lesions, felt that though the tuberosities of the cortex in the brain show some relationship to a neoplastic condition, as for instance the presence of giant cells, they never undergo a true neoplastic transformation and never produce clinical symptoms of compression so characteristic of cerebral tumors. On the contrary, according to these authors, in substantiation of the same fact stated by Vogt, a regression may take place, an occurrence which does not fully agree with the conception of a tumor in evolution.

Babonneix, in order to harmonize regression with tumor in evolution, concludes his report of a case of tuberous sclerosis by stating that the lesions have to be considered as occupying an intermediary position between the simple malformations and neoplasms. They are somewhat more than the first and much less than the latter, a conception advocated also by Desogus.

In the same year, 1926, Brushfield and Wyatt in their report on "Epiloia" concluded their pathological investigation by stating that tuberous sclerosis is the expression of a congenital lesion characterized by marked hyperplasia of the neuroglia cells, which gives rise to tumor-like masses in various portions of the brain. The authors did not feel, however, that the condition should be classed with the tumors and concluded that a satisfactory etiology seemed to them impossible to determine.

In 1928, Bolsi emphasized the neoplastic tendency of the neuroglia in tuberous sclerosis as proved by the association of glia tumors with lesions of tuberous sclerosis (Kaufman,[27] Schuster,[28] Berliner,[29] Licen,[30] Von Meduna,[31] etc.). At the same time he stated that though neoplastic tendencies of the neuroglia must be recognized, a histogenetic disorder may also lead to the formation of atypical nerve cells and that therefore the essence of tuberous sclerosis would be better indicated by the most comprehensive term of neuroblastomatosis. However, Bolsi adds, "we must be dealing with a peculiar type of blastomatosis which limits its action to some

laminae and only to parts of the convolutions without invading the primary and secondary sulci as the true tumors do."

Bielschowsky, followed later by Ayala and Sabatucci,[32] tended also to correlate tuberous sclerosis with Recklinghausen's disease. According to these authors the two diseases differ only as to the topographical distribution of the spongioblastic phenomena, a central one in the case of neurofibromatosis. Among the two extremes, transitory forms are represented by central neurofibromatosis associated with gliomas or tumors of other nature, or possibly by cases of central or peripheral gliomas.

Orzechowski and Nowicki[33] suggest that tuberous sclerosis be renamed "neurinomatosis centralis," that peripheral neurofibromatosis should be spoken of as "neurinomatosis peripherica," and that the term "neurinomatosis universalis" should be applied to cases in which the two disorders are associated.

Weber, Parkes and Perdrau[34] are said to have demonstrated neurofibromatous growth in the kidney in a case of tuberous sclerosis. In Gamper's[35] case a patient with generalized Recklinghausen's disease showed at autopsy numerous interesting anomalies within the nervous system. These included two "neurinomatous" growths lying under the ependyma, multiple ventricular tumors of glia origin, sclerosis and blastomatous proliferation with demyelinization in the frontal lobes and in the vermis, and circumscribed nodules in the cerebellar hemispheres (reported by Critchley).

The identity of certain histological appearances in tuberous sclerosis and in Recklinghausen's disease has also been pointed out by Feriz[36] and Bielschowsky.[37] Thus in both conditions there may be seen hyaline thickenings in the vessel walls (Feriz), abnormal monster cells (Bielschowsky), and similar histological changes in the cerebellum (Orzechowski and Nowicki).

Van der Hoeve,[38] who pointed out that the retinal tumors (phakomata) may occur in both tuberous sclerosis and Recklinghausen's disease, suggests the designation of tuberous sclerosis as "phakomatosis Bourneville" and the neurofibromatosis as "phakomatosis Recklinghausen." Critchley and Earl feel that the similarities between the two processes have perhaps been rather overemphasized, while Nieuwenhuijse[39] definitely concludes his investigation on this

subject by denying the identity between neurofibromatosis and tuberous sclerosis.

Yakovlev and Guthrie[46] in 1931 considered tuberous sclerosis the result of developmental anamolies of the ectoblasts leading to functional deficiency of ectodermic organs, and in the nervous system especially as the most differentiated of these organs.

Globus, Strauss and Selinsky[41] in 1932 expressed the opinion that tuberous sclerosis is the manifestation of a disseminated neurospongioblastomatosis in which both neuroblasts and spongioblasts are abnormally developed. They base their conclusion on the description of numerous cases of tuberous sclerosis in which definite tumors are associated with the diffuse lesions and the histology of which discloses the presence of both spongioblasts and neuroblasts at various stages of development. In 11 cases which they describe, the tumor was located in the strio-thalamic region and the cells (spongioblasts and neuroblasts) were collected in small nests. In some of the tumoral nests the spongioblasts predominate, in some others, the neuroblasts.

The process of tuberous sclerosis has been considered as an end result by the majority of authors though Bielschowsky in 1914 expressed the opinion that the pathological process may not end in the intrauterine period of life but may have stages of reacutization after birth. Omodei Zorini and Mattirolo felt also that the process of tuberous sclerosis is capable of evolution. They pointed out that near old sclerotic areas, foci of acute degeneration are found in which hyperemia or hemorrhages or proliferation of the glia nuclei are visible. These authors insisted particularly on the possible mechanical alteration of the blood vessels, followed by ruptures and hemorrhages, as a result of which the process may progress and complication may set in. Bolsi has also pointed out the importance of microglia reaction as an expression of progressive reactive phenomena to the sclerotic process.

As to the adenoma sebaceum which often accompanies the process of tuberous sclerosis, some authors considered the condition the expression of a germoplastic developmental defect of the skin involving especially the sebaceous glands. In support of their contention they point out that the germoplasm defect not only involves

the skin but also a number of other organs (kidneys, heart, liver, brain, etc.), where the changes are analogous to those in the skin (Olson[42]). Adenoma sebaceum is thus a part of a widely distributed disorder.

The adenoma sebaceum was first described by Pringle[43] in 1889, and Pasini[44] in 1909 was able to report on 46 cases collected from the literature. According to the latter, the adenoma of Pringle is a small tumor deeply implanted in the dermis, bulbing as a cone or a sphere and slightly pedunculated at the base. Some tumors are found especially in the genio- and naso-labial folds. When tumorous, they collect and press against each other but never fuse together. Adenoma sebaceum has a symmetrical distribution and is more often found on the chin, the eyelids and other frontal locations.

At times the adenoma sebaceum makes its appearance after infectious diseases, such as scarlet fever (Kopp[45]) and measles (Bushke-Bolsi and deBenedetti[46]). Of 46 cases of adenoma sebaceum 21 showed abnormality of function of the central nervous system (Pasini).

The adenoma sebaceum does not necessarily indicate a process of adenomatous neoformation of the sebaceous gland. The histological structure of the small tumor consists particularly in hyperplasia of the connective tissue and a certain amount of vasodilatation. The connective tissue is poor in cells and is covered by a thin epidermis with thinning of the papillae. Hair follicles are rare and the sweat glands may be normal or even absent in the growth. Only rarely are they hypertrophic. In the adenoma of Pringle there are occasionally accumulation of nevic cells which indicate its relationship to the nevi. This is why Pasini proposes for it the name of "angectasic fibromatous naevus" of the face or, more briefly, "Pringle's disease."

II. Clinical Considerations

Tuberous sclerosis, also termed "Epiloia" by Sherlock,[47] a term later accepted by other authors, (Brushfield and Wyatt,[19] Brain and Strauss[48]) is the name applied to the syndrome showing mental deficiency, epileptic fits, adenoma sebaceum, nodular sclerosis

of the cerebral cortex, and tumors of the kidney and other organs of the body.

According to Brushfield and Wyatt it appears that at first only the skin disorder (adenoma sebaceum) was described. The majority of the cases were congenital, but in a certain number adenoma sebaceum appeared first at puberty or in adult life. Further it was noted in the latter cases that other members of the family were subject to a similar condition of the skin. Records of more recent date drew attention to the fact that certain cases of tuberous sclerosis of the brain cortex are associated with a peculiar skin rash. Later still the association of epilepsy with adenoma sebaceum, tuberous sclerosis of brain and kidney tumors was noted.

According to MacDonald, Critchley and Earl, the examination of relatives of epiloiac subjects justifies their viewpoint that the following clinical variances represent incomplete forms of tuberous sclerosis.

(1) Adenoma sebaceum alone.
(2) Adenoma sebaceum with epilepsy but no mental change.
(3) Adenoma sebaceum with symptoms of cerebral tumor.
(4) Visceral tumor alone (including retinal tumors).

Concerning the question whether histological changes occur in the brain of individuals who during life have shown adenoma sebaceum alone, Critchley and Earl feel that it is not unlikely that slight alterations might be found in the cortex of such individuals, differing only in degree from those occurring in epiloia.

The possibility of latent cerebral changes existing in patients with simple adenoma sebaceum is further borne out by the occasional development of insanity in middle life in cases which up to then were of dermatological interest only.

As to the question of whether the presence of primitive visceral tumors alone without accompanying mental or nervous abnormalities or without adenoma sebaceum, constitutes a *forme fruste* of tuberous sclerosis, the authors mention cases on record in which an individual, otherwise normal, had been under the care of an urological surgeon for a renal tumor, and where at postmortem examination typical cerebral changes were discovered. They also

mention the case of Van der Hoeve who found a retinal tumor in the fundus of a patient aged 21, who showed no other abnormalities. The nature of the tumor was revealed when investigation of the family history discovered five brothers and sisters suffering from advanced tuberous sclerosis.

Joseph Sailer[49] in 1890 reported 28 cases of tuberous sclerosis which had been seen by others and one of his own. To this must be added three cases reported by Pellizzi in 1901. Yet Campbell[50] in 1905 illustrating one case of the disease refers to only 20 cases in the literature. Freeman in 1922 gives an estimate that approximately 100 cases have been reported. It must be borne in mind, however, as Freeman points out, that the association of tumors of other organs with the focal sclerosis of the cortex has resulted in reporting cases of tuberous sclerosis under many titles, and a comprehensive review of the literature is therefore difficult. Titular reference is in some instances to the cardiac tumors, in others to the renal tumors, while still others in which the cutaneous tumors were prominent, are found under the name of adenoma sebaceum.

At the same time and since Freeman's paper, additional cases have been described by Josephy[51] (1921), Kirch-Hertel[52] (1921), Pollack[53] (1922), Bielschowsky (1923-24), Brushfield and Wyatt (1926), Mattirolo and Omodei Zorini (1926), Bolsi (1928), Bolsi and deBenedetti (1930), Critchley and Earl (1932), Globus, Strauss and Selinsky (1932), et al.

That the disease is quite rare is substantiated by the fact that during the past 19 years, only 15 cases out of a total admission of 4,644 epileptics to Craig Colony (New York State) which limits its cases to convulsive disorders, have been admitted to that institution.

Sex: In our material seven of the cases were males and 10 females. Also according to Sherlock, females are affected more commonly than males.

Race: Concerning race, out of 17 patients, six were of Italian extraction, two were of English extraction, and one was of Russian extraction. We have no sufficient data available with regard to the remaining cases.

Etiology: Freeman feels that degeneracy in the parents is a factor while other authors have brought forward the importance of prolonged labor and birth injury. In one of our cases there was a history of difficult labor.

A few authors following the lead of Scarpatetti mention congenital lues as an etiological factor. In our clinical material, in five cases the blood Wasserman test was positive, in seven cases negative, in three cases no Wassermann tests were performed and in two cases no data were available regarding serology. Both parents of one of the cases showing positive serology (case no 17) were reported as luetic.

Other authors have emphasized the importance of general infectious condition. In our material in case No. 4, the maternal grandfather is said to have suffered from tuberculosis; in case No. 14, the mother died of tuberculosis.

As for the incidence of convulsive manifestations in other members of the family, in case No. 8, there is mention of one brother dying at three years of age following convulsions; in case No. 11, one brother is reported to have died at the age of 11 days of spasmophilia (?); in case No. 12, a maternal cousin is reported to have had convulsive seizures.

The occurrence of tuberous sclerosis in more than one member of the same family has been reported in the literature. Of particular interest are the cases of Bouwdijk, Bastianse and Landsteiner[54] in which five out of nine suffered from tuberous sclerosis and the ones of Kirpicznik[55] in which the grandfather suffered from an inoperable tumor of the kidney (hypernephroma), the father showed adenoma sebaceum, renal tumor, epilepsy and tuberous sclerosis, and the patient, tuberous sclerosis, adenoma sebaceum, renal tumor and epilepsy. Mention must also be made of the case of Van der Hoeve in which the family history disclosed five brothers and sisters suffering from advanced tuberous sclerosis. Finally, Fabing[56] reports the incidence of tuberous sclerosis in one pair of twins. In our material, cases Nos. 1 and 2 were sisters. In case No. 3 the mother of the patient died of hypernephroma.

The importance of traumas in early childhood has never been satisfactorily discussed in connection with the development of the

clinical features of tuberous sclerosis. In our material we have been able to elicit in the history of some of the cases evidence of fall on the head or other type of trauma. Such incidences of trauma are reported in case histories Nos. 4, 8 and 9. In case No. 4 there is a mention of trauma of the head at three weeks of age by a closet door. In case No. 9, there is a history of trauma in that the baby fell into the bath tub. The age of occurrence and severity of injury are not given. In case No. 8, there is a history of a fall at seven months of age when the baby struck the back of his head and the first seizure following the head trauma.

At other times, though there is no definite history of trauma, the physical examination reveals the presence of scars which might be attributed to some of the falls during the epileptic seizures but might leave a doubt also as to their possible correlation with a causative trauma. The presence of scars over the head in various locations is reported in cases Nos. 6, 13 and 15.

From the clinical standpoint, focal symptoms in our material were present in cases Nos. 9, 13, 15 and 16. In case No. 9 there is a history of right-sided paralysis and slight involvement of right side of the face. In case No. 13, there was dragging of the right foot; in case No. 15, there was a hemiparesis of lower left extremity with a Babinski sign, and in case No. 16 there was reported dragging of the right foot and shuffling gait. Case No. 17 disclosed failing vision. These last two cases were cases of tuberous sclerosis associated with brain tumors.

The incidence of gross malformation is only mentioned in case No. 15 where a rudimentary fourth toe was present in each foot.

Symptomatology: The disease is characterized by three cardinal symptoms. First, progressive intellectual deterioration; second, epileptiform convulsions; third, a skin condition involving generally the nose and extending upward and outward to each cheek.

1. *Mental Status:* According to Freeman in cases in which the chief clinical expression is mental regression, development may be comparatively normal for several years. Usually the children are slow to walk or talk, but sometimes they are active and intelligent, and may even attend school for a number of years. More characteristic than the cessation of development, however, is the deterior-

ation which follows it. The child ceases to take interest in playthings, prefers to sit still, loses the power of attention, becomes indifferent to everything which had previously attracted him, becomes untidy and often masturbates excessively.

In our material the mental condition of the patient was referred to as one of idiocy in cases Nos. 1, 2, 5, 13 and 14 or as quite defective and of an imbecile level in most of the remaining ones.

In a few instances, as in case No. 3, the parents of the patient claimed that the child developed normally until seven years of age. At the age of 15 years appropriate tests disclosed a mental age of six and one-half years. In case No. 7, where the convulsive seizures began at eight years of age, the child never attended school. In case No. 11 the patient is said to have developed normally in infancy and childhood, but at 20 years of age the mental test revealed a mental level of five years. Case No. 16 was labeled as being always feebleminded, whereas in case No. 17 the mental picture was more one of schizophrenia.

2. *Convulsions:* Convulsions usually are the first manifest symptoms. In Hartdegen's[57] case, the attacks began a few hours after birth and continued until the end, two days later. Bruckner's[58] patient, on the other hand, was nine years old when the first convulsion occurred. When once initiated the convulsions usually continue, although they may decrease in frequency or even cease. The first attacks are usually mild, without loss of consciousness and they may effect only isolated groups of muscles. During a period of years, however, they become gradually more severe and may even be the direct cause of death. The attacks are quite evenly spaced and are not as paroxysmal as those of the atrophic scleroses. At times, equivalents of attacks are noted, fainting spells, attacks of excitement and so-called psychic epilepsy.

In our cases, the convulsions began at the following ages—Case No. 14; spasms began immediately after birth; cases Nos. 1, 2 and 10: 3 months; cases Nos. 6 and 8: 7 months; case No. 4: 8 months; case No. 13: 9 months; case No. 9: 10 months; cases Nos. 5, 12 and 15: 12 months; case No. 3: 7 years; case No. 7: 8 years; case No. 16: 14 years; case No. 17: 18 years.

Most of the seizures were of the various types of grand and petit mal. In case No. 17 the attacks were presumably equivalents. In case No. 3 there was a definite gastric aura.

The number of attacks reported as occurring during the stay of the patients at Craig Colony is the following:

Case No. 1, seven attacks of grand and petit mal per month; case No. 2, one attack per month; case No. 3, seven attacks per month; case No. 5, five attacks per month; case No. 7, one attack every day; case No. 10, one attack per month; case No. 15, three or four attacks per month. In case No. 4, one attack per year. In case No. 12, there had been a period of six years (1916-1922) with no attacks, and finally in case No. 17, no grand or petit mal attacks occurred.

As for the incidence of definite vasomotor changes, some of the cases, Nos. 4, 5 and 15 disclosed cyanosis of the extremities, particularly the two first cases.

3. *Skin Conditions:* This is known as adenoma sebaceum, the general contour of the skin lesions resembling a bat, the body represented by the nose and the eruption extending laterally, representing the bat's outstretched wings. These skin lesions have been considered the expression of hypertrophic sebaceous glands (Fig. 1) on a highly vascular base. They are raised above the skin surface and are felt as hard nodules. They vary in size from a pinhead up to about four mms. in diameter. In some instances as in the case reported by Freeman this characteristic skin lesion was absent. At Craig Colony it has never been found that a case of tuberous sclerosis coming to autopsy did not show such characteristic skin manifestations. If at admission no signs of adenoma sebaceum were present, later on the skin lesions did develop, as occurred in case No. 2. It follows that in some of the cases reported in the literature without skin lesions, the adenoma sebaceum might have developed later had the patients lived longer.

The association of tuberous sclerosis without facial manifestations but with neurofibromas has been reported in various instances and in our own material several cases presented such an association. In case No. 7, numerous warts and moles over the entire body were encountered and in case No. 11 numerous moles were scattered

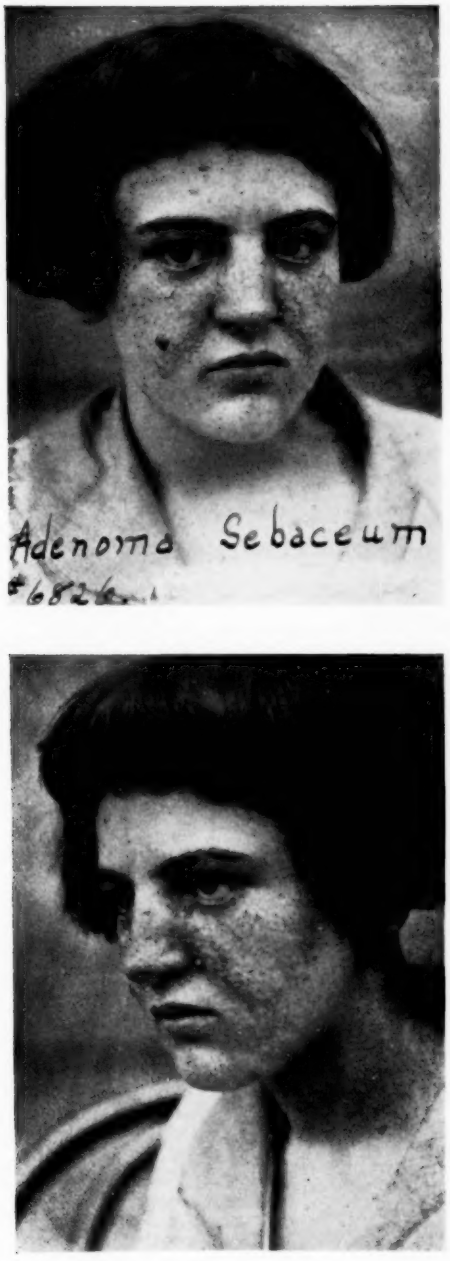


Fig. 1. Front view and profile of patient with characteristic adenoma sebaceum

over the body in addition to a small wart-like papilloma in the right mammary line about three cms. above nipple. There was also a raised pigmented mole about the size of a pea, over the spine of the left scapula. In case No. 16, cutaneous nevi were found over the left forehead and right thigh. In case No. 17 scattered over the neck, chest and region of the axillae were numerous pedunculated outgrowths of the skin giving the appearance of little fleshy tags.

III. Clinical Material

The material on which we are reporting clinical and pathological observations consists of a total of 17 cases, 15 of which were studied at Craig Colony and two of which were in the collection of the Psychiatric Institute, the patients having been originally observed at the Hudson River State Hospital.

Case No. 1:

Summary of Clinical Notes: (M. B., 6465). White female, eight years of age on admission December 2, 1924. Native born as were the parents. Father died at 33 following appendectomy. Mother was living, age 36 and well. Maternal grandmother died at 48. Otherwise grandparents all lived to old age. Patient was the older of two girls; the sister is case No. 2 of our series. First cousin on maternal side stated to be feebleminded.

Personal History: Born 1916 at full term. Labor natural. No adverse prenatal influences. Began to walk at 15 months. Had never talked. Had none of the infectious diseases of childhood.

History of Epilepsy: Onset at three months. Both grand and petit mal. Convulsions averaged seven grand mal seizures per month.

Physical Examination: Head somewhat large but symmetrical. Adenoma sebaceum of the face. Blood Wassermann positive. Died July 10, 1930, of pulmonary tuberculosis, at 14 years of age. No autopsy.

Mental Condition: Idiot. Unable to care for herself in any way.

Case No. 2:

Summary of Clinical Notes: (N. B., 6464). Sister of case No. 1. Born 1918. Native born. Delivery natural. No adverse prenatal

influences. Began to walk at five years. Never learned to talk. None of the diseases of childhood. She could not feed, dress or care for herself in any way.

History of Epilepsy: Onset at three months. She averaged one seizure per month.

Physical Examination: Poorly nourished. Head somewhat large but symmetrical. Very narrow palate. Blood Wassermann positive. Was in constant motion. Rest of physical examination was negative throughout.

Mental Condition: Idiot. Has been at the institution approximately six years. Upon admission showed practically no signs of adenoma sebaceum. This condition is now well marked.

Case No. 3:

Summary of Clinical Notes: (B. B., 6826). Admitted June 23, 1926, at 15 years of age. White female. Native born. Father 49, healthy. Mother died at 48 of "hypernephroma." Fifth in line of birth of four boys and three girls.

Personal History: Born in 1910 at full term, natural delivery. No adverse prenatal influences recorded. Pneumonia at seven months. Whooping cough, age not recorded. Teething began at seven months. Began to walk at one year. Mind is said to have developed naturally in infancy and childhood. Never attended school.

History of Epilepsy: Onset at seven years. Now averages seven seizures per month. Gastric aura.

Physical Examination: Well developed and nourished female. No gross abnormalities. Face covered with adenoma sebaceum. Neurological examination negative except for quite active knee jerks. Wassermann negative.

Mental Condition: Quiet child, causes no trouble. Stream of thought slow. Replies to questions in a slow hesitating manner. No delusions or hallucinations. Only partially oriented. Measured by Terman Scale she shows a mental age of six and one-half years. Imbecile.

This case has the highest intellect of any of the 15 cases reported from the colony. She gets about the colony. Can feed and care

for herself in general. Seems happy and contented. She is able to do a little ward work.

CASE No. 4:

Summary of Clinical Notes: (C. C., 6618.) Admitted to the institution July 30, 1925, at 11 years of age. Born in Russia. Father and mother in good health. All grandparents died in middle age. Patient is fifth in line of birth of three girls and two boys. No history of nervous or mental diseases in family. The maternal grandfather is stated to have suffered from tuberculosis.

Personal History: Born February 8, 1924, at full term. Normal labor and delivery. No adverse prenatal influences. Hit on head at three weeks of age by closet door. Began teething at eight months at which age developed convulsions. Began to walk at four years of age and never talked. Measles at unknown age. "Brain fever" (?) at two and one-half years.

History of Epilepsy: Epileptic seizures began at eight months. They averaged four per year. Grand and petit mal. Right side is first affected.

Physical Examination: Small child. Undernourished. Able to walk. Head is about normal in size and symmetrical. Adenoma sebaceum present. Asymmetrical auricles, left is distinctly larger than right. Teeth are broken and irregular. Cyanosis of all extremities. Remaining physical examination negative with the exception of flat feet. Blood Wasserman negative.

Mental Condition: Seems able to understand to obey very simple commands. She does not talk, makes idiotic sounds. This patient can care for herself in no way. Leads an entirely vegetative existence at the colony.

CASE No. 5:

Summary of Clinical Notes: (M. L., 6010). White female. Italian. Seven years of age on admission, November 19, 1922. Entire family history negative. First in line of birth of four children.

Personal History: Born at full term. Natural delivery. Commenced to walk at two and one-half years. Had never learned to talk.

History of Epilepsy: Onset at two or three months. Average five seizures per month.

Physical Examination: Well nourished, dark complexioned child. Face covered with adenoma sebaceum. Head was symmetrical. Hands and feet somewhat cyanosed. Walked with wabbling gait. Could not feed or care for herself in any way. This child while at the colony had an uncomplicated attack of measles. Blood Wassermann negative.

Mental Condition: Led a purely vegetative existence. Head rotated from side to side and she apparently did not recognize any of her surroundings.

Died at 16 years of age. No autopsy material available.

Case No. 6:

Summary of Clinical Notes: (P. M., 7055). Seven years of age on admission, May 19, 1927. Family history negative. Italian. Patient was second in line of birth of two boys and three girls. All the other children were said to be normal.

Personal History: Born January 20, 1920. No adverse prenatal influences. Labor normal. Teething began at seven months and with the onset of teething convulsions developed. Walked at three years of age. Never learned to talk. Had measles at two years and scarlet fever at one and one-half years.

History of Epilepsy: Onset as stated above at seven months at time of dentition. Generalized motor convulsions.

Physical Examination: Poorly nourished and developed boy. Head showed linear scar on occiput. Microcephalic. Face thin, pointed nose, flaring ears. Vision did not seem to be impaired. Poor teeth. Concave vertebral borders of scapulae. Blood Wasserman 1+. Skin: Adenoma sebaceum on cheeks plus diffuse small, hard tumor-like masses protruding above the skin surface of the forehead and body. Some masses varied in size from that of a head of a pin to that of a good sized pea, (multiple fibromata ?). Discharged from the institution as unimproved August 7, 1929.

Mental Condition: Quite defective.

CASE No. 7:

Summary of Clinical Notes: (S. P., 9467). Male, white, single, age 13 years. Nativity Italy. Arrived in U. S. A. in 1926. Admitted August 28, 1934, upon commitment from Bronx County.

Family History: Father is living and well at 53. He was a barber. Mother is living and well at 52. Patient is not of legitimate birth and is one of a family of five boys and five girls, all of whom are living.

Personal History: Patient was born November 20, 1920, full term, natural delivery and was considered a normal baby. There were no adverse prenatal influences and patient did not have spasms, or convulsions, immediately after birth nor was he paralyzed in any way. He was nursed by mother and was not subject to indigestion. Teething began at 10 months with no untoward symptoms noted at this time. Patient first walked at 14 months and was unable to say more than a few words. He had never attended school. Patient had scarlet fever, measles and whooping cough. He was successfully vaccinated while in Italy.

History of Epilepsy: The first attack, a severe convulsion occurred at eight years of age without an apparent cause. The second attack occurred six hours after the first and the third a few days later. Succeeding attacks occurred almost daily, accompanied by biting of tongue and incontinence, not preceded by a warning, and were either mild or severe in character, occurring during waking and sleeping hours, with no focality, with an apparent loss of consciousness, and following which the patient was automatic. He had fallen during attacks and received injuries to his head. The greatest number of attacks in any one 24-hour period was three, accompanied by fever. Excitement seemed to make attacks more frequent. Patient at times would become "hysterical."

Physical Examination: Height 56½ inches, weight 77 pounds. Nutrition poor. Malformation: Head is covered with black hair showing few gray hairs. Longest diameter 20 cms., shortest diameter 15 cms. Circumference 55.5 cms. Bi-auricular distance 36 cms. Naso-occiptal 37. Facial length 13 cms. Irides brown. Pupils equal and regular and react to light. Tonsils enlarged. Hutchinson's teeth, rachitic chest. Sebaceous adenomata on nose, chest and

chin. Numerous warts and moles over entire body. Genitals: hypertrophic. Feminine distribution of pubic hair. Extremities: Upper: underdeveloped; lower: pes planus. Reflexes: elbow, wrist, normal. Achilles normal; patellars active, abdominal and cremasteric, present; plantar in normal direction. Motor functions: Walks with a wide base. Station and balancing power poor. No tremors or twitchings observed. Coordination of movement is poor. No paralysis. Sensory: There are no apparent disturbances. Special senses: Eyes and ears normal. Does not speak. Has had no seizures so far this year (1934). Blood Wassermann negative.

Case No. 8:

Summary of Clinical Notes: (J. F., 7877). White Italian male, single. Father born in Italy, mother in U. S. Age 11 on admission, March 26, 1930. Five boys and four girls in the family, the patient being the seventh in line. Three boys and one girl were dead, the girl dying at two and one-half years of pneumonia, one boy at 17 months of pneumonia, one boy at 20 months of colic (?), and one boy at three years of convulsions.

Personal History: Born July 30, 1918. Instrumental delivery. Walked at 20 months, showed weakness in legs. Did not talk until four years. At seven months fell from a baby carriage, striking back of head.

History of Epilepsy: First seizures at seven months following head trauma. Both nocturnal and diurnal seizures and both grand and petit mal.

Physical Examination: Height 5 feet. Weight 122 pounds. Well nourished. Head longest diameter 19.5 cms. shortest diameter 16 cms. Circumference 56.5 cms. Face which was covered with adenoma sebaceum was rather well shaped and he had a rather pleasing expression. Eyes: Pupils equal, react normally to light and accommodation. No nystagmus or strabismus. Mouth: Negative. Chest, heart and lungs: negative. Blood pressure: systolic 80, diastolic 50. Abdomen: negative. Neurological examination was negative throughout with the exception of speech. He says only such words as "hello" and "goodbye."

Mental Condition: Mental age one year, three months, I. Q. 12—rated as an idiot. Colony life uneventful. Feeds himself but wets and soils.

The following nine cases to be reported have died at the institution:

CASE No. 9:

Summary of Clinical Notes: (C. V., 3608). White male, native born, 11 years of age on admission in 1912. Family history negative throughout. Third in line of birth of three boys all living.

Personal History: History of trauma, baby fell into bathtub, age and severity of injury not given. Some weakness in right side; wore a brace in his shoe.

History of Epilepsy: Onset at 10 months. Indefinite history of illness followed by right-sided paralysis. This had practically disappeared by the time of admission.

Physical Examination: Well nourished. Dull, listless expression. Eyelids droop. Prominent occiput. Lips thick and pouty. Pes planus. Reddish papular eruption, over nose and both cheeks. Reflexes normal. Slightly lessened motility of right side of face. Wassermann not done.

Mental Condition: In constant motion. Could not talk but at times broke out in a sing-song tone. He led an uneventful existence. Would sometimes stand in the middle of the floor snapping the fingers of the left hand and gyrating from right to left holding his left heel stationary.

Died March 25, 1921, of lobar pneumonia at the age of 20. No autopsy secured.

CASE No. 10:

Summary of Clinical Notes: (J. B., 7440). White Italian male, single, 14 years of age on admission, October 24, 1928. Practically nothing about family or personal history.

Personal History: Patient was born October 26, 1914. Had measles at nine years of age.

History of Epilepsy: Onset at three months. Both grand and petit mal and both nocturnal and diurnal seizures. While at the Colony averaged about one seizure per month.

Physical Examination: Showed the following abnormalities: The frontal and parietal bossae are quite prominent, giving him a square-shaped head. Defective features and expression. Thin,

pointed nose. Marked adenoma sebaceum. Wassermann 2+. Erosions of teeth due to grinding. Vertebral borders of scapulae are convex. No focal neurological signs.

Died May 29, 1932, of pulmonary tuberculosis, at the age of 17 years.

Mental Condition: Idiot.

CASE No. 11:

Summary of Clinical Notes: (L. C., 5463). White female, 20 years of age on admission in 1920. Native born as were her parents. They were both living and healthy. Patient was first in line of birth of two boys and one girl. One boy died at 11 days of spasms (?).

Personal History: Born at full term. Labor lasted three days. Stated to have been blind in one eye at birth. Mind is said to have developed naturally in infancy and childhood. Measles at five months. Pertussis at 13 years.

History of Epilepsy: Convulsions began at four and one-half years. Averaged three seizures per week throughout residence.

Physical Examination: Fairly well developed and well nourished female, lips thick and everted. Face covered with adenoma sebaceum. Numerous moles scattered over body. Strabismus in right eye. Left pupil normal. Right irregular, does not react to light. Some opacity of right cornea. Rest of examination negative with the exception of decayed teeth. Reflexes all present, somewhat exaggerated. Wassermann negative.

Mental Condition: Dull. Grasp on current events and school knowledge nil. No evidence of delusions or hallucinations. Yerkes-Bridges mental test graded her at five years. Imbecile. Could not care for herself in general.

She resided in cottages for lower grade patients while at the institution. Was pouty, and at times disagreeable. Otherwise Colony life uneventful. On May 28, 1923, she had a series of epileptic seizures, death following these. Age at death 25 years.

Gross Pathological Findings:

Face: Particularly about mouth and cheeks, covered with purplish red papilliform eruption. Small wart-like papilloma appears in right mammary line about three cms. above nipple. Raised pig-

mented mole about size of pea, immediately over spine of left scapula.

Pleural Cavity: Fibrous adhesions between visceral and parietal layers of pleura most marked in apical region.

Lungs: Right, dark red in color and quite voluminous. Moderately anthracotic. Crepitates rather poorly throughout but floats in water. Moderate emphysema along free margins of various lobes. Upon palpation a moderate number of small, irregular, very firm black nodular masses which approximate in average size an ordinary pea are found and sectioned with great difficulty because of calcareous deposit in them. Internal structure of these minute nodules is apparently homogeneous throughout and characterized by a marked deposit both of pigment and calcium. There are also present a number of small white nodular masses about the size and form of a split pea, of a somewhat firmer consistency but which section with comparative ease. Intervening lung tissue is highly resilient and is the seat of moderate pigmentary deposit. Weight 440 grams. Left, the changes found in upper lobe of left lung correspond to those described for same lobe of right lung. In lower lobe the same abnormalities which have just been described for corresponding lobe of right lung but there pathological process manifests itself to a greater extent and more advanced degree. Weight 520 grams.

Aorta: A limited number of small, discrete sclerotic plaques are sporadically distributed along the entire course of vessel.

Liver: Sporadically embedded in hepatic substance are a few small white nodules resembling in size and form an ordinary pea. On section they present an apparently homogenous structure displaying a smooth white surface. Weight 1,080 grams.

Kidneys: Capsule not adherent but everts with ease, displaying a smooth even surface, closely studded with small white areas about the size of a split pea. These nodular masses are in the main discrete but in a number of instances have become confluent, forming larger white areas of irregular outline. Cut section shows that these white areas penetrate beneath the surface and into the substance of the kidney to a depth of about five mms.

Spleen: Sporadically embedded in the substance of the spleen are a few small white nodules approximating in average that of an ordinary pea. These nodular masses are of slightly firmer consistency than the surrounding splenic pulp. Upon section they appear homogeneous in structure and present a smooth, even, white cut surface. Weight 75 grams.

Head: Features blunt, lips everted. Covered with papilliform eruption, particularly about the lips and over the cheeks. No apparent facial asymmetry.

Brain: Of normal size and configuration, with definite symmetrical cortical pattern. Upon external inspection the cortex showed rather broad convolutions and quite deep sulci. Upon palpation, numerous areas of unusually firm consistency varying in size from that of an almond to that of an English walnut were felt in the cerebral substance. These areas were irregular in the distribution but occurred chiefly in the parietal and occipital regions and the lower portion of the temporal lobes; somewhat more numerous in the left hemisphere. The brain tissue intervening between the areas just described was spongy, particularly in the parietal and frontal regions. Moderate injection of the cerebral vessels was observed throughout. The midbrain, pons, cerebellum and medulla appear grossly normal. Weight 1,215 grams.

(No histological examination of the nodules located in the lungs, liver and spleen is found in the protocol of the case. No material available.)

Case No. 12:

Summary of Clinical Notes: (M. V., 2885). White female. Italian. Three years old on admission, October 29, 1909.

Family History: Fourth in line of birth of one boy and five girls, all living. No history of nervous diseases in immediate family. Maternal cousin had convulsive seizures.

Personal History: Born at full term. Strong, fat baby. Not subject to indigestion or fits of crying. Commenced to walk at two and one-half years. Had scarlet fever and measles at one year.

History of Epilepsy: Had pneumonia following measles and was very ill for two weeks with much coughing and many convul-

sions. Reappearance of seizures occurred one year after pneumonia.

During 1912 and 1913 she had no seizures; in 1914 and 1915 she had one grand mal seizure each year. From 1916 to 1922, inclusive, she had no seizures. In 1923 she had five grand mal seizures, in 1924 seven grand mal seizures and in 1925 four grand mal seizures.

Physical Examination: Fairly well-nourished baby, dark complexioned. Eczema in occipital region. Slight asymmetry of skull, the left parietal eminence seems more prominent than the right. Upon admission the skin condition appeared more like that of an eczema. Urinalysis negative. Child was unable to walk on admission. Wassermann not made.

Mental Condition: Could not talk. Was in almost constant motion and frequently gritted her teeth. Recognized her bottle and would feed herself when she could get hold of it. Imbecile.

During her colony residence she led a rather uneventful existence, vegetative in nature. She presented the characteristic facies of adenoma sebaceuum. She frequently uttered cries and guttural sounds. Her chief pastime was to sit on floor and sharply flex the trunk forward and strike her head on the floor or on some object. She would sometimes place her fist doubled up on the floor and strike her head on her fist. She could not care for herself in any way.

This patient died April 30, 1926, of inanition of idiocy. Autopsied. Age at death 20 years.

Gross Pathological Findings:

General Survey: Body of white female. Small oblique linear scars scattered over the scalp and face. Irregular, rather coarse, red papillary eruption over nose and cheeks.

Pleural Cavity: On both sides firm fibrous adhesions between the visceral and parietal pleural layers, most marked in the apical region.

Lungs: Right, salmon-pink in color and rather small in size. Moderately anthracotic, creptitates well and floats in water. Upon palpation a number of nodular masses each about the size of a marble and of firm consistence are felt in the pulmonary tissue. Weight,

295 grams. Upon section the nodules present a homogeneous white surface with a rather sharp line of demarcation between them and the surrounding lung tissue. Cut section discloses a surface which is a light salmon-pink in color, is the seat of moderate pigmentary deposits. Left similar to right. Weight 210 grams.

Heart: Negative.

Peritoneum: Negative.

Liver: Rather small in size, brownish red in color, with a fairly firm consistency and a smooth and glistening capsule. Embedded in the surface of the hepatic substance appear a number of rather small white areas which are definitely circumscribed and show a clear line of demarcation between their substance and the liver tissue. These vary in size from one to four mm. in diameter. Cut section of the organ shows a surface which is dark brownish red in color, has a rather definitely checker-board pattern, and is studded with a moderate number of white nodular areas, approximating in size that of an ordinary pear, which are homogeneous and of slightly firmer consistency than the liver tissue in which they are embedded and from which they show a sharply circumscribed line of demarcation. The intervening hepatic substance has a rather shiny or greasy appearance. The weight of the liver is 1,045 grams.

Adrenal bodies: Negative.

Kidneys: Right, rather small in size. The capsule is not adherent but everts with ease exposing a small renal surface from which a moderate number of white nodular roundish masses project. These are fairly firm in consistency, sharply circumscribed and approach on the average the size of a split pea. Cut section discloses a renal surface which is rather light red in color and shows rather good structural differentiation. Embedded in the renal substance are a number of sharply circumscribed white masses of slightly firmer consistency than the renal tissue. These areas are similar to those described for the liver and are distributed throughout the organ although they occur most frequently in the cortical region, where some of them constitute the protruding masses seen upon everting the capsule. The width of the cortex is

five mms. The weight of the right kidney is 135 grams. Joint weight of both kidneys is 270 grams.

Ovaries: Negative.

Uterus: Infantile.

Spleen: Fairly large in size, with a smooth and glistening capsule. The organ is brick-red in color and its surface presents a peculiar glazed appearance and is studded with a small number of sharply defined white, round masses, somewhat firmer in consistency than the splenic tissue and similar to the masses already described in the liver and kidney. Cut section presents a surface which is also brick-red in color and has likewise a peculiar glazed appearance. Structural differentiation is clouded. Pulp is quite soft in consistency and rather easily friable. The weight of the spleen is 105 grams.

Pancreas: Negative.

Stomach: Negative.

Intestines: Negative.

Face: No apparent asymmetry. Over the cheeks and across the nose is a peculiar reddish papular eruption consisting of a great number of small red elevations about the size of a split pea, set closely together, so as to give the entire areas involved a rough uneven topography.

Eyes: Negative.

Brain: Small in size but symmetrical with a clear cut, rather even cortical pattern. The sulci are narrow and the convolutions slender. Upon palpation, the cerebral substance shows great variation in consistency. Irregular coarsely granular areas are present in the frontal and parietal regions on both sides. Both these lobes are quite extensively involved. To a lesser extent, similar areas are found in the occipital lobe. The intervening brain tissue is apparently of normal consistency. Cut section further discloses the invasion of the sclerotic appearance in the areas described. Weight of the brain 970 grams.

Pituitary body: Negative.

(No available material for the histological studies of the organs except the brain.)

CASE No. 13:

Summary of Clinical Notes: (N. E., 5446). White English male, six years of age on admission, October 17, 1920. No education.

Family History: Mother suffered from incipient tuberculosis in 1910 and had since then been discharged as cured. Patient second of two children, both boys. Brother was living and in good health. No history of nervous or mental disease in family.

Personal History: Born at full term. Instrumental delivery. Not injured in any way, no convulsions or paralysis immediately after birth. Always fretful and suffered from colic and indigestion. Walked at 16 months, never talked. Stated to have always dragged right foot in walking.

History of Epilepsy: First symptoms occurred at nine months, described as associated with unconsciousness, rigidity for a few minutes, then twitching of limbs followed by prolonged spells of crying and finally sleep. At this time attacks occurred several times a day. Received bromide, gland extracts and osteopathic treatment (?). A surgeon performed a decompression operation upon the left side of his head, stating "We found nothing at operation."

Physical Examination: Poorly developed and undersized. Decompression scar on left side of temporal region. Skull symmetrical. Face: Idiotic expression. Showed no interest in surroundings. Some drooling. Bright red rash over malar bones and bridge of nose which resembled adenoma sebaceum of tuberous sclerosis. Eyes: Negative. Teeth: In very poor condition. Considerable gingivitis. Chest, abdomen, genitals and extremities, negative. Neurological: Sensation apparently normal in all parts of the body; no motor deficiencies. Reflexes were all active and patellar considerably active. No vasomotor disturbances. Wassermann negative.

Mental Condition: Patient walked about aimlessly, being in constant motion. Paid no attention to questions asked. Could not be influenced in his conduct. Could not talk but occasionally made guttural sounds and cried like a baby. Mentality was purely of the vegetative type. Idiot. Age at death 13 years.

Gross Pathological Findings:

General Survey: The body of a white male child age 13 years. Fairly well developed but rather poorly nourished. Height 48 inches. Estimated weight 70 pounds. Indentation scar over the left temporal region. Bright red papular eruption over the nose and malar prominences (adenoma sebaceum). Postmortem lividity moderate in dependent parts. Rigor mortis moderate.

Lungs: Edematous. Heart: Myocardium of good color and of firm tone. There is slight dilatation of the right auricle but no hypertrophy is present. Aorta: Negative. Vena Cava: Filled with a moderate quantity of dark red clot.

Thyroid Gland: No pathological findings.

Liver: Dark red in color with a smooth and glistening capsule. Cut section presents a homogeneous dark red surface. The weight of the organ is 780 grams.

Adrenal bodies: Rich in chromaffin material.

Kidneys: Dark red. The surfaces of both kidneys are sporadically studded with a number of small white nodular masses. The capsule is adherent to the substance of these nodular masses, some of which remain attached to the capsule when the latter is stripped, otherwise the capsule everts with ease leaving a smooth even renal surface. Cut section discloses a surface which shows good structural differentiation and presents a fair proportionate width of cortex (four mms.). Cut section of the nodular masses previously described shows them to be roughly circular or oval in shape, varying in size from that of an ordinary pea to that of an almond, white in color and apparently homogeneous. These nodular masses are quite firmly embedded in the parenchyma of the kidney and even involve the entire width of the renal cortex, sometimes even invading the medullary substance. The weight of the right kidney is 110 grams, of the left kidney, 115 grams.

Spleen: Dark red in color and of fair proportionate size with a smooth and glistening capsule. Cut section presents a dark red surface which shows excellent structural differentiation. The weight of the spleen is 85 grams.

Pancreas: Negative. Stomach: Negative.

Meninges: Dura, pia and arachnoid normal throughout.

Brain: Of normal size, with a well-defined bilateral, symmetrical cortical pattern. Upon palpation the cerebral substance is found to vary markedly in consistency. Nodular masses varying in size from that of an ordinary pea to that of an English walnut are irregularly scattered throughout the cerebral substance, but are most numerous in the parietal regions. Cut section shows that these nodular masses not only involve the substance of the cortex but also appear in the lateral ventricles as subependymal tumors of various sizes. A cauliflower-like mass made up a number of nodules averaging about the size of a filbert was found to occupy the third ventricle. The midbrain, pons, cerebellum and medulla appear normal upon external examination and section. Weight of the brain 1,390 grams.

Pituitary body and sella turcica: Normal.

(No available material from the kidneys.)

Case No. 14:

Summary of Clinical Notes: (H. F., 2303). Age 14, white female, single. No education or occupation. Nativity—Canada.

Family History: Mother suffered from headaches and died of tuberculosis. Father suffered from headaches. Maternal grandmother died of obstruction of bowel.

Personal History: Had spasms immediately after birth and during dentition. Was said to have been paralyzed on both sides immediately after birth. Had pneumonia, age not stated.

History of Epilepsy: No assigned cause. Convulsions began shortly after birth. Seizures were grand mal. Occurred both nocturnally and diurnally. Frequency: One every day before admission, then two every day, at the beginning of history at the hospital. Recently series of attacks about every six or eight months.

Physical Examination: Small in stature, but otherwise well nourished. Marked moist seborrhea of scalp, face and nose. Large irregular shaped scar in the vulvar region. Enlarged posterior cervical glands, serous nasal discharge, decayed and notched teeth. Heart is irregular in rate being most rapid at height of inspiration. Slight murmur heard best at apex but not always synchronous with the heart's action. Voracious appetite. No paralysis evident. Slight occasional blapharospasm. Wassermann not done.

Mental Condition: Idiot.

This patient had scarlet fever in 1911 and had an abscess on right cheek. Abscess on right breast in 1914 and in 1917 ileocolitis. In 1918, measles and influenza. In 1921 she gave a negative Schick reaction. She was given three doses of typhoid paratyphoid vaccine in 1924.

Died on April 4, 1927, cause of death: Ileocolitis. Age at death 33 years.

Gross Pathological Findings:

General Survey: Body of a white female, poorly nourished, showed pressure sore on back and sacrum. Rigor mortis fairly well marked. No lividity. Scalp negative. Skull negative.

Lungs: Right, weight 270 grams. Left, weight 190 grams. There was some passive congestion of both lungs, otherwise negative.

Heart: Weight 195 grams. The heart was pale and showed some degenerative changes. Valves were free and apparently competent.

Liver: Weight 650 grams. Upon sectioning showed some fatty infiltration. The gall bladder and ducts were patulous and no other abnormality was discovered.

Spleen: Weight 65 grams. It was soft and lacking in structural differentiation.

Kidneys: The combined weight of the two kidneys was 205 grams. Several tumor-like masses were found in the cortex of both kidneys. These were of firm consistency and upon sectioning showed a white surface resembling fibroid tumors. They varied in size from that of a pea to one the size of a hickory nut.

Gastro-intestinal tract: There was marked inflammation of the lower third of the ileum and the colon. The mucous membranes lining this portion of the intestines were congested and in various places showed small ulcerations, none of which had ruptured.

All the other organs examined were found to be in normal condition.

Brain: Weight 1,130 grams. The brain was found to contain numerous tumor-like nodules scattered over the entire surface, but more especially marked in the parietal and temporal lobes. These varied in size from that of a pea to that of a small walnut. They

were very firm in consistency. The entire brain was removed and preserved in formalin.

CASE No. 15:

Summary of Clinical Notes: (C. W., 9513). Female white, single, age 27 years. Native of United States. Admitted upon commitment from Queens County, September 25, 1934. No education or occupation.

Family History: Father was living at 63 years in good health. He was 36 years of age when patient was born. Mother was living at 55 years of age in good health. She was 28 years of age when patient was born. Patient was second in line of birth of one boy and three girls. No further history given.

Personal History: Born June 7, 1907, at full term. Natural delivery. Mother was worried and frightened before birth of patient. Nursed by mother. Teething commenced at one year. Walked at three years and commenced to talk at three years. Never attended school. Had measles at three years and smallpox at two years.

History of Epilepsy: Onset at one year, during teething. Second attack occurred one week later. At time of admission had three or four attacks per month. Had mild and severe attacks, occurring during sleep and when awake. Consciousness was apparently lost at each attack. Sleep followed attacks.

Physical Examination: Height 4 feet 10¼ inches, weight 110 pounds. Circumference of head 54 cms. Occipitofrontal 29 cms. Biparietal 33 cms. Face was covered with a butterfly arrangement of tumor masses, typical adenoma sebaceum. Scar over right eye. No ptosis. No nystagmus. Marked external strabismus in right eye. Pupils equal in size, regular in form and reacted to light and accommodation; irides brown.

Ears, taste and smell: Could not be examined because of patient's mentality.

Chest: Deformed, left more prominent than the right. Percussion and auscultation of heart and lungs negative.

Digestive and Abdominal Organs: Abdomen was soft. Liver and spleen apparently not enlarged.

Nervous System: Normally sensible to pain, heat, cold and touch. Some cyanosis of the feet. No scaliness, loss of hair or change of nails. No dermatographia. Abdominal and epigastric reflexes not elicited. Elbow and wrist present, equal and active. Knee jerks present, a little more active on the right side than on the left. Plantar normal on right. Babinski on left. Fourth toe on both feet is very small rudimentary toe, probably has just one phalanx. Motor functions: there seemed to be an old paralysis of the left leg, where some spasticity was present. Coordination of movement was poor. Wassermann negative.

Mental Condition: Mental age of one year, three months. Mental status: Idiot.

Died: October 15, 1934, at 3:00 p. m. Cause of death: inanition. Age at death: 27 years. Autopsied: October 16, 1934, at 11:00 a. m.

Clinical Diagnosis: Inanition of idiocy, tuberous sclerosis, neoplasm (?)

Gross Pathological Findings:

General Survey: White, female. Adenoma sebaceum across the bridge of nose and on cheeks. General nutrition: Good. Hypostatic lividity, slight. Rigor mortis, slight.

Thorax: Marked right lateral sclerosis of the dorsal spine with deformity of the chest. Upper respiratory passages: Normal.

Pleurae: Normal. Right lung, weight 350 grams. Slight hypostatic congestion at the base. Left lung, weight 330 grams. Same as the right.

Mediastinal Lymph Nodes: Not enlarged.

Pericardium: Normal. Heart: Weight 300 grams. There was a moderate degree of hypertrophy of the left ventricular wall. The mitral valve leaflets were thickened and adherent to each other. The opening admitted the tip of the thumb. Mitral stenosis. Aorta: Normal.

Esophagus, peritoneum, stomach, small and large intestines: Normal.

Liver: Weight 1,060 grams. Tumor-like mass in the right lobe anteriorly, about the size of a walnut. This was whitish in color and rather soft in consistency. Two similar smaller nodules the size of a pea were found in other parts of the liver.

Gall Bladder: Contained about 20 faceted gallstones of various sizes. Spleen: Weight 60 grams. Normal. Pancreas: Weight 25 grams. Very small and atrophic. The head especially being unusually small.

Right Kidney: Weight 250 grams. Filled with large tumors of varying consistency. These tumors nearly entirely replace the renal tissue. Left Kidney: Weight 255 grams. At the upper pole of the kidney was a fatty tumor the size of a small orange. This was attached to the kidney by a band of loose tissue. Adrenals: Normal.

Ureters: Normal. Urinary Bladder: Not opened.

Sexual Organs: Normal.

Skull: Unusually thick and dense being about one-half inch in the occipital region. Dura matter: Normal. Pia arachnoid normal. Intracranial blood vessels, normal. Quantity of cerebrospinal fluid, normal. Total weight of brain, 1,170 grams.

Brain: The brain quite typical of tuberous sclerosis. Many convolutions are firm to the touch while others are of normal consistency. The sclerosed areas appear to be more numerous in the frontal and occipital poles and in the temporal lobes.

Pituitary Body: Normal.

Case No. 16:

Summary of Clinical Notes: (M. D., 10213). Admitted to the institution (Hudson River State Hospital) April 14, 1901, at the age of 15. Father living. Mother died of childbirth at the age of 34. Catholic. Birthmark over left eye. Scar on right hip and stomach caused by burn.

Personal History: Age 21. Always feebleminded. Suffered from the usual childhood diseases. Menstruation began at 14 years of age. Patient has always been violent, noisy and destructive.

History of Epilepsy: At the age of 14 first convulsions began. At 15 her gait became shuffling and there was a tendency to drag her right foot and since then there were almost daily convulsions. For a few months before that, nausea and vomiting.

Physical Condition: Present weight 111 pounds. Present condition good. No accompanying diseases. There were cutaneous nevi on the left forehead and right thigh.

Mental Condition: Simple, confused, mumbles. Can talk but tone, poise and expression very childish. Could not be made to do simplest of home tasks. Never attended school.

Course in Hospital: At times the patient was very troublesome and threw herself to the floor; would kick and scream as loudly as possible. At times she was untidy and filthy in habits. Her appetite was fair. She had to have constant attention. She was very destructive with clothing, and would use profane and vile language. She would become incoherent, irritable and confused. She would assault others without reason.

On February 28, 1907, patient had a hemorrhage from uterus at 6:00 p. m., and was put to bed. March 1, 1907, patient had a temperature of 103° and died at 6:20 p. m.

Clinical Diagnosis: Imbecility with maniacal attacks.

Gross Pathological Findings:

General Survey: Remains are those of a fairly well-nourished woman about 20 years of age. The hair of the head is short and dark. A nevus extends from the left eyebrow to the hair and a short distance into it. This mark is about two cms. wide. Another nevus is seen over right eyebrow, 1.5 by 3 cms. Skin of face, body and extremities is blanched, except in dependent parts where there is some postmortem hypostasis. Numerous freckles on face. Pupils moderately dilated, round and equal; sclera bluish-white. Several teeth missing. Vaccination scar on external surface of left arm at midportion. Just above the sacrum the skin is broken down over an area of 10 cms. in diameter, result of a burn. Over right ileum is an old white raised scar about 10 by 10 cms. irregular in shape, apparently the result of a burn.

Incision shows a moderate amount of subcutaneous, pericardial, mesenteric and omental fat. Attached to the descending colon and mesocolon, above sigmoid flexure is a new growth about five cms. in diameter, the walls are thin and dark red fluid is contained within. On slightly squeezing the growth, two small masses each suggestive in size and appearance of an ovary are seen through the walls. The organs appear normal in size and are in normal relations except the left kidney which is very large. There are no adhesions in chest or abdomen.

Heart: Musculature firm. Pericardial sac contains about usual amount of fluid. There are a few small patches of soft atheroma in mitral segments. The divisions between segments of aortic valve are firm, showing some calcification. The coronaries, at their beginning show some soft atheroma, and there are a few patches in the wall of the aorta, weight 240 grams.

Lungs: In certain portions they are of dark red color and section shows considerable congestion here. Bronchial glands are normal. Right lung, weight 470 grams. Left lung, weight 395 grams.

Liver: Capsule is normal. The centers of the lobules are seen as dark red dots, with yellowish color at the periphery of each. Gall bladder normal. Weight 1,325 grams.

Spleen: Capsule, normal. Section shows small round whitish areas about two mms. in diameter, in the substance, scattered throughout, shows some congestion, weight 155 grams. Pancreas, normal.

Gastro-Intestinal Tract: Normal except for the tumor mentioned above. The two hard bodies when removed from the sac containing them are found to have rough exterior and are almost white externally, and on section the sac contains partly coagulated blood.

Kidneys: Left, is found to be a large firm mass, about 12 by 18 cms. in size. On section at the superior pole some kidney structure is made out, and in this are two cyst cavities, one about two cms. in diameter, the other about one cm. In the center of the new growth which macroscopically has the same appearance as the interior of the growth, attached to the colon, is a cavity about 5 by 8 cms. in size. This cavity is packed with a large soft dark red clot and some fluid blood. Right, capsule strips fairly readily. There are several small retention cysts. No unusual macroscopic change, except that substance is rather firmer than normal. No macroscopic change in suprarenal is made out. Weight of left kidney, 735 grams (with clots) and weight of right kidney is 185 grams.

Bladder: Is much distended, reaching about one-half the distance between the symphysis pubes and the umbilicus. Within the bladder dark red soft clots and a large amount of fluid blood are found.

Brain: Calvarium and diploe are normal. Over the surface of each hemisphere are three areas in which substance is firmer than usual, one well forward in frontal area, another the center of which is in region of paracentral lobule, the third in the parieto-occipital region. Each area is about four or five cms. in width. In left lateral ventricle is a tumoral growth of about three to four cms. in diameter, and macroscopically is of the same structure as the growth in the kidney. Weight 1,360 grams.

Anatomical Diagnosis: Sarcoma (?) of left kidney with metastases, one attached to colon, one in anterior portion of left lateral ventricle of brain; increase of connective tissue in kidneys, with cyst formation, slight atheroma of mitral and aortic segments, with some calcification of aortic valve, slight atheroma in wall of aorta; spleen shows numerous small white bodies in substance, each about two mms. in diameter and soft. Fatty liver.

(No material available for histological study of tumors of kidney.)

Case No. 17:

Summary of Clinical Notes: (J. K., 15251). Born 1873. Admitted March 3, 1910, to the Hudson River State Hospital.

History on Admission: The father was a native of England. He was said to have died at the age of 73 of syphilis. The mother is said to have been infected with syphilis by her husband. She died at the age of 75 of Bright's disease. Patient was last of 10 children, four of whom died in infancy. Attended school from 5 to 13 years of age; he was backward in his studies. At the age of 15 drove a wagon for a fruit store but never got along with his employer. At the age of 18 began to have spells when his blood seemed to "stand still and he would forget what he was about." For the four years before admission, he had not experienced these attacks. Did practically no work after the age of 20. The duration of the mental trouble was said to have been about 20 years. For the past eight months he thought he could hear God talking to him and that God had given him the power to do as he chose with the whole world. Expressed suicidal thoughts. Two weeks before admission he was arrested on a charge of vagrancy and sent to Blackwell's Island for five days. He admitted that he frequently left home and

got lost. His eyesight had been gradually failing for the past two years. The commitment papers give the cause of his trouble as hereditary syphilis.

Condition on and Shortly After Admission: Patient was aroused with difficulty and much trouble was experienced in getting him to reply. He was inclined to neglect his personal appearance. There was evidently a lack of interest not only in himself but also in his surroundings. Appetite voracious at times. The mental examination showed coherent replies with very little spontaneity, and with practically no elaboration. The range of thought was very limited. He said he felt sad because people had claimed that he scandalized the Sisters of Charity. He didn't know whether this was true or not, but he thought he should make some penance. He spoke of his food having a peculiar taste at times. Said that he had the gift of faith, and that he could stop the war by raising his hand. He thought this power had been taken from him because he did not use it. Said he always thought he would be killed by electricity. Orientation approximately correct. There were some defects in memory for recent and remote events. Calculation was fairly good for simple tests. Partial insight. He said "It's a little bit out of order. Sometimes I don't know what I am doing, sometimes I am all right. My heart's broke." Unable to write legibly.

Physical Summary: Of middle age, of fair development with reduced nutrition and reddened granular conditions of the skin about the mouth and nose; numerous pedunculated outgrowths of the skin, diminution of the visual powers, (double optic atrophy). Slightly enlarged heart, exaggerated deep reflexes.

Subsequent Course: Patient's condition varied from time to time. He was very hypochondriacal and as a result of these ideas he had to be placed in bed for a few days at a time. He would then brighten up and take more interest in his surroundings. He was uniformly dull and not inclined to associate much with other patients. He recognized the attendants and physicians as such. Occasionally he was troubled with hallucinations. He spoke of these as "different sounds, like people talking to me or the Man above (God)." "He told me to stop the Civil War or religious war." He was occasionally mute. During the brighter periods he could

not explain why he would not reply at times. He died suddenly November 13, 1910, of acute dilatation of the heart.

Gross Pathological Findings:

Small warty growths about the face. Thickened elevated portion of the scalp over the left temporal region. Left pupil larger than right.

Lungs: Free in the chest cavity. Passive congestion.

Heart: There is some thickening along the free margin of the mitral valves and the left ventricle wall is hypertrophied measuring two cms.

Liver: Large, capsule thickened. On section there is some congestion.

Spleen: Normal aside from a small linear scar extending in from the capsule.

Kidneys: On each side beneath the peritoneum there is a dark red nodular new growth enclosing the kidneys. Each of these measures nearly 12 inches in length and five inches in diameter. On section they present a somewhat lobulated appearance with streaks of kidney tissue scattered about.

Nervous System: The brain is large with considerably flattened-out convolutions. There is a general bulging and fluctuation of the entire brain. Scattered over the surface of the brain superficially in the cortex there are firm hard nodules. Over the tip of the temporal lobe on the left side there are numerous small warty elevations. The optic nerves were thin and gray.

The floor of the third ventricle was bulging and the pons was somewhat flattened. The medulla and anygdalae formed a cone-shaped mass as a result of being pushed backward and downward into the foramen magnum. Transverse sections showed the right lateral ventricle about twice the size of the left and the walls of the ventricles uneven and nodular; in the vicinity of the foramina Monroe there were two nodular tumor masses which appeared to lie on the surface of the ventricles; one was about two cms. in diameter, the other slightly smaller.

This case is particularly interesting because of the clinical mental manifestations labeled "dementia præcox."

The location of the tumoral mass (Fig. 36) interfering with the third ventricle may explain the feeling of sleepiness which the patient disclosed while at the hospital.

IV. Histopathological Reports on Our Own Material

The histopathological findings of the seven cases studied are being reported as a whole with additional description of the tumor material in the two cases in which tuberous sclerosis was associated with a cerebral neoplasm.

Gross Pathological Findings: In various convolutions, a number of more or less prominent areas are found, with no definite site of predilection. At times the prominences which may appear as definite nodules occupy large areas of the brain convolutions; at others they are localized essentially in their tops. Some of the areas, which on section appear whitish, are one-half cm. in diameter; others one, two cms. or even more. In other instances the whitish areas, though not bulging externally are found, at section, involving one or more convolutions. An example of a large area extending over three convolutions is given by Fig. 2 where the precentral and the frontally adjacent convolutions are involved by the pathological process. Details of such an involvement can be seen in Fig. 3. There the changes are visible to the naked eye, the demarcation between the gray and white matter having disappeared. Involvement of the frontal and occipital poles is frequently found. Occasionally small nodules are prominent over the external surface of the hemisphere but more frequently in the ventricular areas, particularly the lateral ones. As a result of such growth the ventricles may present a very uneven and tuberous appearance. The tuberosities in the ventricle may be quite pronounced and occasionally may fuse into a good sized mass.

The study of the external configuration of the brain reveals very little of abnormality in the distribution of primary, secondary and tertiary sulci, most of the external pattern being quite normal. The size of the ventricles is variable, in some instances being normal, in others, quite enlarged, particularly in cases where the nodules or the tumoral mass interfere with the communication between lateral

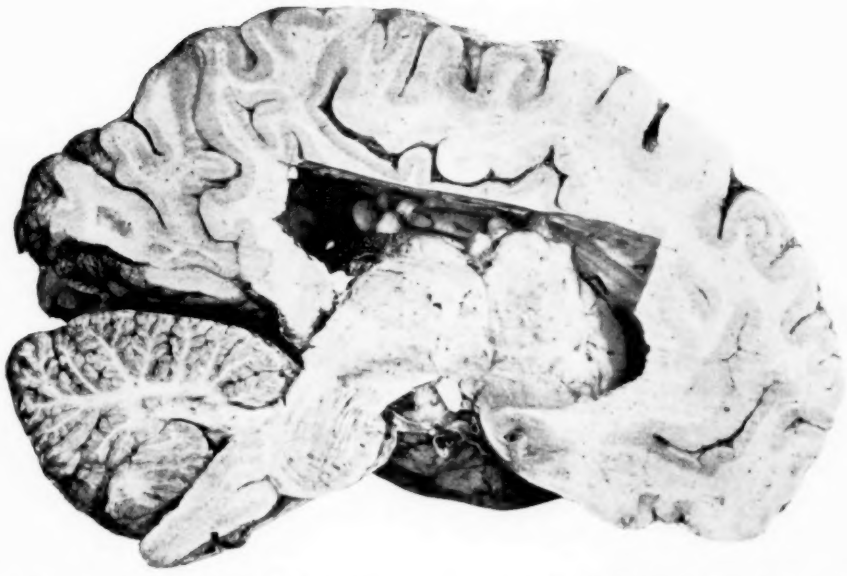


Fig. 2. Macroscopic aspect of ventricular cavity displaying the presence of numerous small nodular prominences

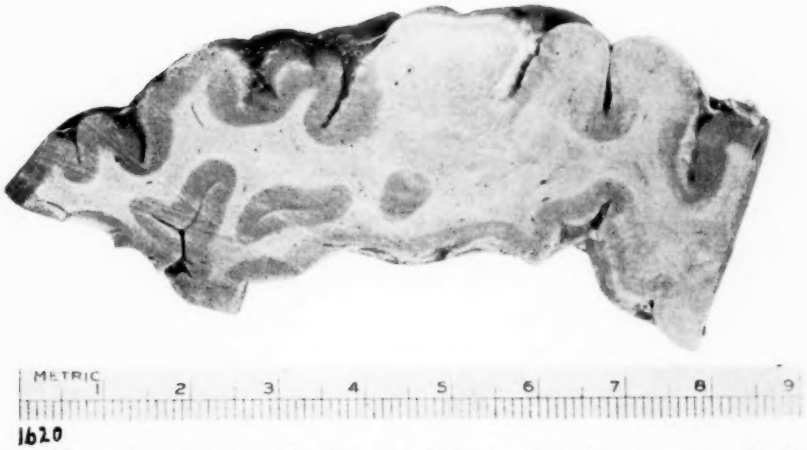
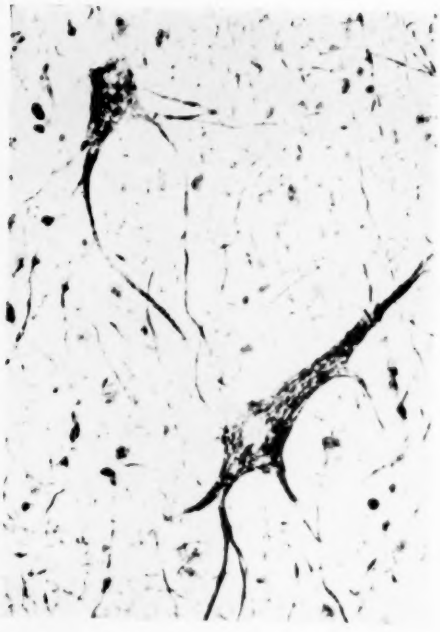
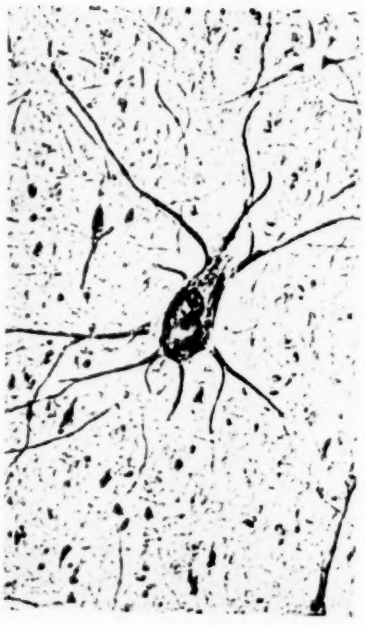


Fig. 3. Macroscopical aspect of three convolutions undergoing a process of sclerosis. Note the disappearance of the normal demarcation between white and gray matter

UNIV. OF MICH.





Figs. 8-a, 8-b. Neurofibrillar structure of the cytoplasm of elements of nerve cell nature. Bielschowsky's method for neurofibrils

Fig. 9-a

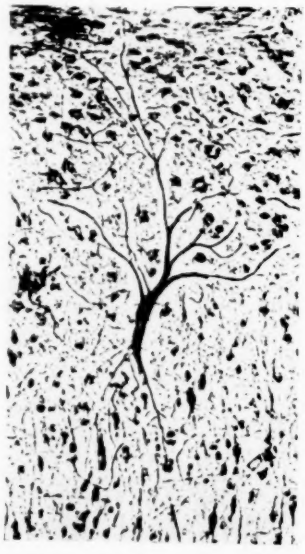
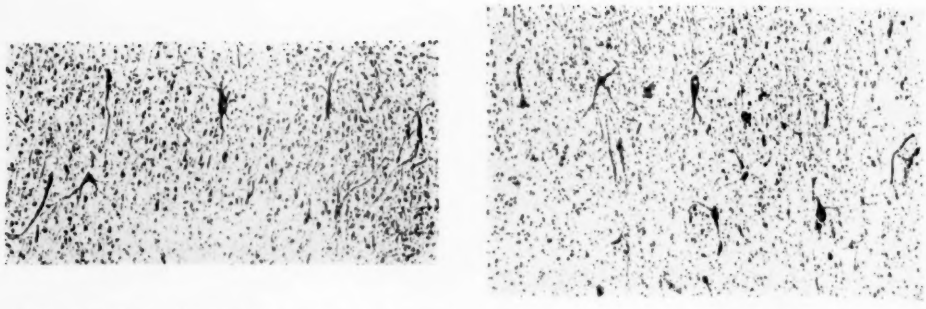


Fig. 9-b

Fig. 9-a. Neurofibrillar structure of a giant elongated nerve cell in the gray matter.
Fig. 9-b. Hypertrophy and hyperplasia of the dendritic process of a nerve cell in the second cortical layer
Bielschowsky's method for neurofibrils

UNIV. OF MICH.



Figs. 6-a, 6-b. Giant nerve cells in the external layers of the cortex. Bielschowsky's method for neurofibrils

Fig. 7. Giant nerve cells in the inner layers of the cortex. Bielschowsky's method for neurofibrils

UNIV. OF MICH.

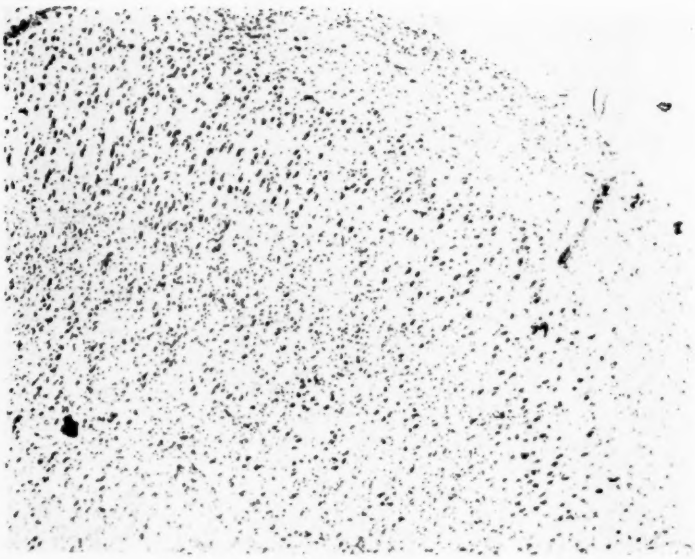


Fig. 4. Broadening of the lamina molecularis and considerable reduction of nerve cells in the inner layer of the cortex. Nissl stain preparation

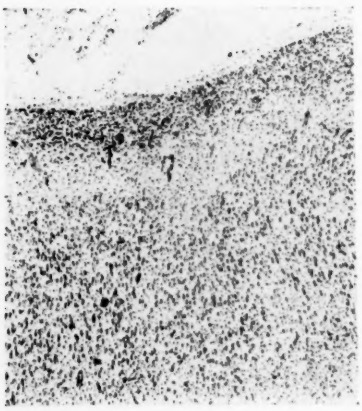


Fig. 5-a

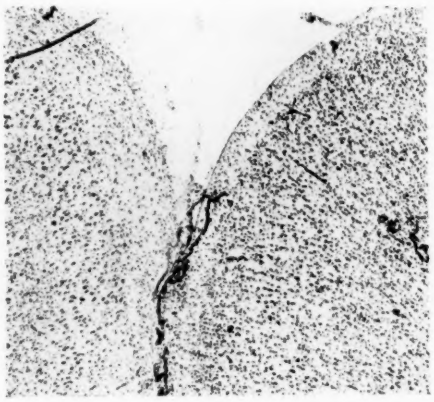


Fig. 5-b

Fig. 5-a. Accumulation of proliferated glia cells in the lamina molecularis

Fig. 5-b. Compare the depth of the lamina molecularis on the left side of the picture with the same lamina in a normal convolution (right of the picture)

UNIV. OF MICH.

and third ventricles. The pia arachnoid is slightly thickened and only occasionally patches of considerable thickening are disclosed.

Histological Studies: One of the main histological features of the cortex is a disturbed lamination in the areas corresponding to the typical nodules or to the whitish patches previously mentioned. Corresponding to such areas, there is often found a very broad lamina molecularis with a considerable global diminution of the pyramidal cells particularly in the third and fifth layers. Fig. 4 illustrates the considerable broadening of the lamina molecularis and the above-mentioned reduction in number of the pyramidal cells. Fig. 5-a illustrates the same broadening of the lamina molecularis with considerable proliferation of glia nuclei. Fig. 5-b allows a comparison between an apparently well-preserved convolution, (right of the picture) with an involved one (left of the picture).

The disturbed lamination, occasionally assumes a striped appearance in the sense that it involves part of layer in its longitudinal aspect. At other times, the disturbance is patchy in distribution or cuts perpendicularly through various cortical layers.

Accompanying the disturbed lamination is the presence in the various cortical layers of very large cellular elements, distributed in all the layers, but more so in the third one. With appropriate staining or impregnation methods the nature of such large cells appears undoubtedly to be that of a nerve cell. Such large cells are well illustrated at low power in Figs. 6-a and 6-b. Fig. 7 illustrates at higher power some of the details of the nerve cells (nucleus and processes). The relative size of such giant nerve cells (Riesenzellen of the German authors), to the surrounding normal elements is particularly well illustrated in Figs. 6-a and 6-b. In Figs. 8-a, 8-b and 9-a the neurofibrillar structure evidenced by the Bielschowsky method for neurofibrils leaves little doubt as to the nerve cell nature of such elements. The hypertrophy of the nerve cells is generally uniform and involves the cell body, the nucleus and both dendritic and axonal processes. In a few instances, as represented in Fig. 9-b, the hypertrophy of the dendrites is more pronounced as a result of which areas are found in which a bush-like

appearance of the tissue is established through the intertwining of hypertrophic dendritic processes.

The orientation of the nerve cells in the various layers is not a constant one, large nerve cells being found variously directed, some occupying an almost parallel plane, some others an oblique one. Occasionally a cell is found with its axone directed toward the outer layers.

Large nerve cells are not only confined to the gray matter but are also seen in the white matter. With appropriate histological methods large structures definitely recognizable as nerve cells are found scattered here and there in the white substance. Such cells are at times isolated, at others collected in clusters of four or five elements. Fig. 10 illustrates a group of them stained by the Nissl method. Occasionally in the vicinity of apparently normal nerve cells, others are found undergoing various stages of degeneration. The aspect of the degenerated cells particularly in the white matter is a variable one and creates now and then a difficulty in establishing the real nature of the degenerating structures. It is possible, however, through the study of transitional stages to acquire a fair certainty as to their nerve cell nature. Figs. 11-a and 11-b illustrate degenerative aspects of some of the nerve cells impregnated by means of the Bielschowsky method, the structure on the left being located in the white substance, the one on the right in the gray matter.

Glia Cells: There is a considerable increase of the neuroglia elements in both the cortex and in the white substance. In the cortex the increase of glia cells is particularly pronounced in the molecular layer, as illustrated in Fig. 3-a. In the other layers, however, a considerable hyperplasia of astrocytes is also found, as illustrated in Fig. 12. In addition to the increase in number there is an increase in size of the individual elements. Such an increase in size reaches here and there considerable proportions and giant cells are seen, the glia nature of which is beyond doubt. Figs. 13-a and 13-b illustrate such giant astrocytes as revealed with the gold sublimate method of Cajal. The relative size of such large elements to the surrounding normal ones is obvious in Fig. 13-a. The monster glial cells are also found isolated or collected in clusters of

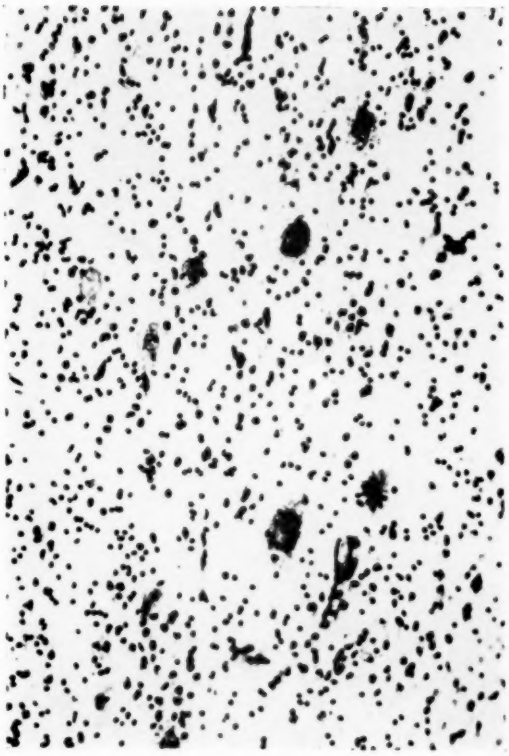
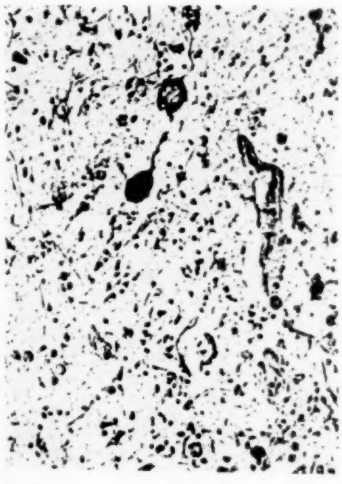
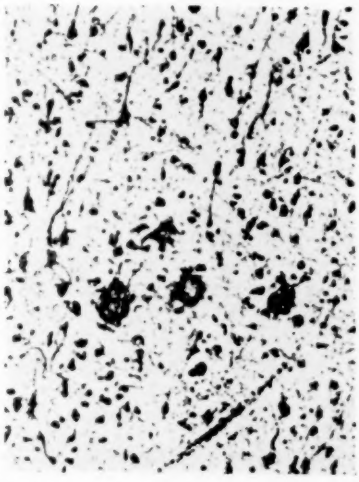


Fig. 10. Large nerve cells in the white substance. Nissl method for nerve cells





Figs. 11-a and 11-b. Degenerated nerve cells in the white and gray matter. Bielschowsky's method for neurofibrils

UNIV. OF MICH.

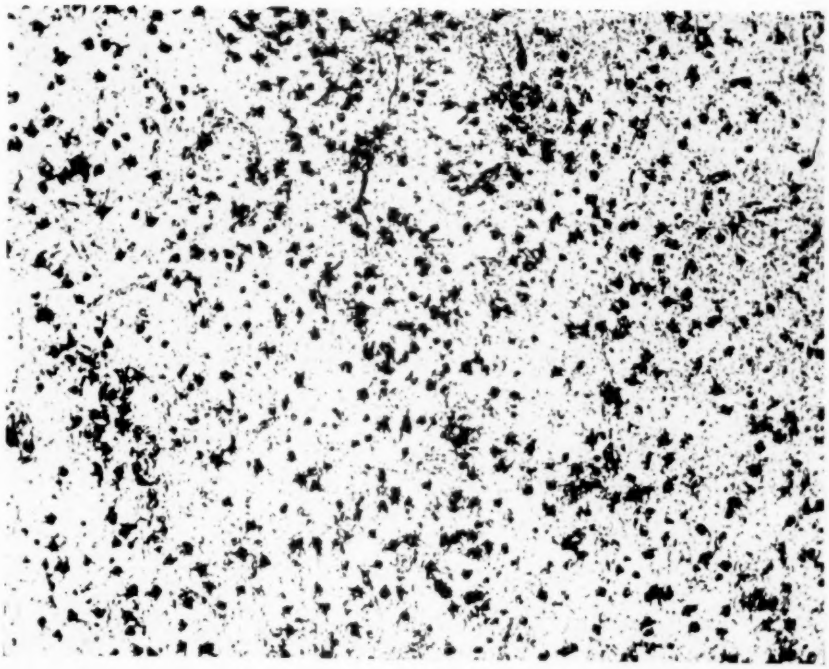
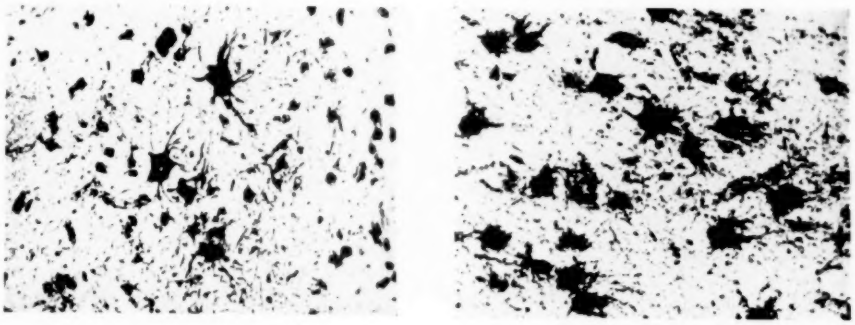


Fig. 12. Hyperplasia of astrocytes in a sclerotic area. Cajal's Gold Sublimate method for astrocytes



Figs. 13-a and 13-b. Giant astrocytes found in the midst of proliferated glia cells. Cajal's Gold Sublimate method for astrocytes

UNIV. OF MICH.

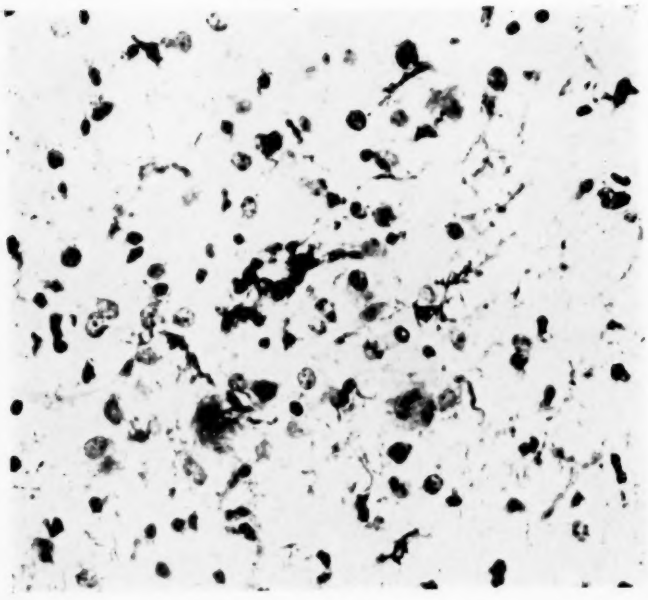


Fig. 18. Hyperplasia and hypertrophy of microglia cells. Silver Carbonate Method of Del Rio Hortega

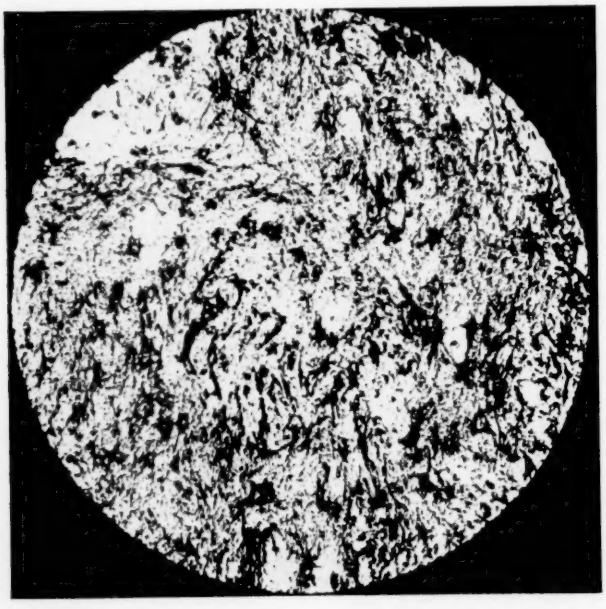


Fig. 19. Small nodular tumor disclosing accumulation of glia cells and glia fibers. Cajal's Gold Sublimate method

UNIV. OF MICH.

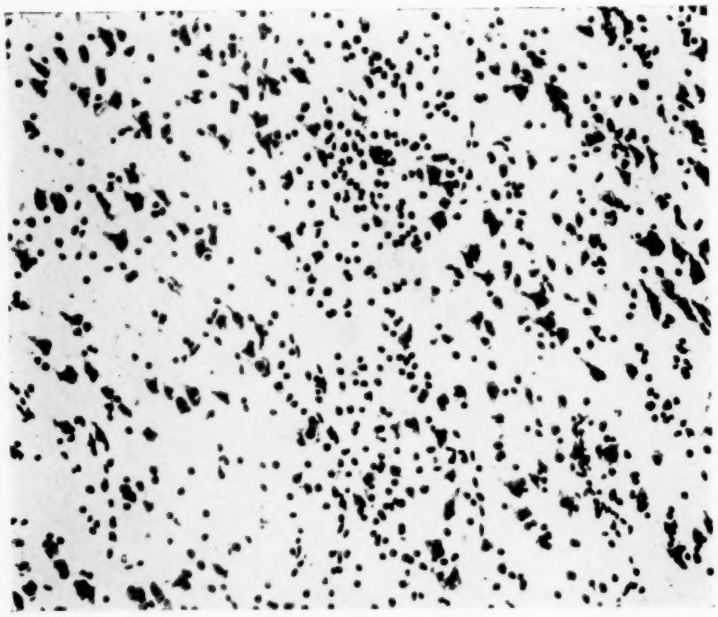


Fig. 16. Focal collection of oligodendroglia cells and neuronophagia of some of the nerve cells. Nissl stain

Fig. 17. Hypertrophic microglia cell. Silver Carbonate method of Del Rio Hortega

UNIV. OF MICH.

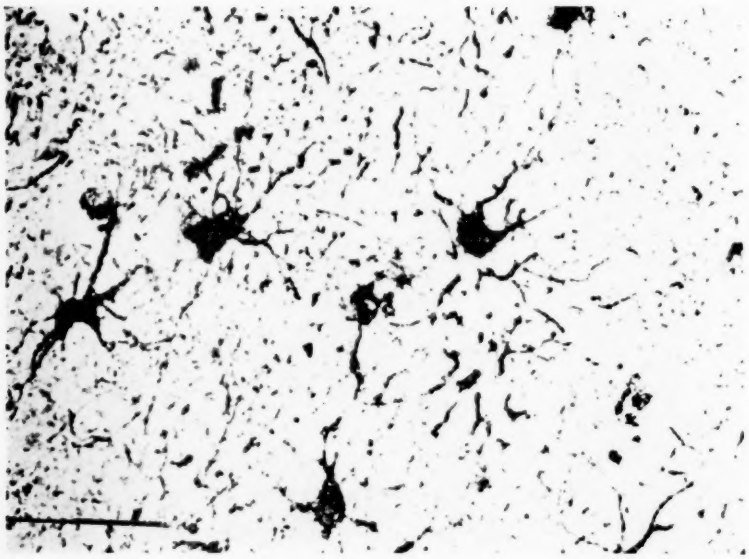


Fig. 14. Hypertrophic astrocytes undergoing degenerative changes (clasmatodendrosis). Cajal's Gold Sublimate method for astrocytes

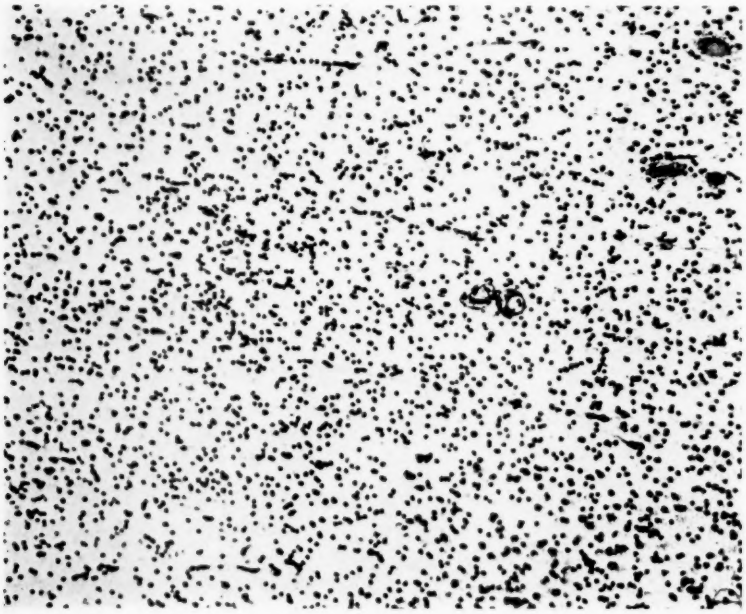


Fig. 15. Diffuse increase of the small glia cells probably oligodendroglia cells in the white substance. Nissl stain

UNIV. OF MICH.

several units. Such giant cells are found in both the cortex and the white matter, thus paralleling in distribution that of the monster nerve cells. As already mentioned in respect to the nerve cells, large glia elements are also seen undergoing degenerative changes, represented by a breaking down of the processes, (clasmatodendrosis) and gradual disintegration of the cell body (Fig. 14).

In addition to the large nerve cells and astrocytes there is in the white matter a definite increase in the oligodendroglia cells. These cells may be distributed in rows, more or less parallel to the nerve fibers and to the longitudinal axis of some of the blood vessels or diffusely scattered in the white substance, (Fig. 15). Occasionally in the gray matter, but more often at the boundaries between white and gray matter, the accumulation of oligodendroglia assumes the aspect of localized clusters, surrounding nerve cells which here and there are undergoing active neuronophagia, (Fig. 16). With the staining method at our disposal it is almost impossible to establish how many, if any, of the increased small cells of the white substance are cells of the indifferent type.

In some areas oligodendroglia cells are seen undergoing a process of hypertrophy in which an increase in the cytoplasm is accompanied by thickening of the processes. A most common finding is, however, an acute swelling of such cells. The microglia elements are also seen undergoing here and there a process of hypertrophy. Fig. 17 represents a hypertrophic microglia undergoing an initial process of degeneration. In addition to hypertrophy there is a definite increase in the number of cells particularly visible in nodular distribution, corresponding to some of the sclerotic areas. Diffuse proliferation of the microglia cells is also found in correspondence to the areas in which proliferation of astrocytes is in action. In our material we never encountered, however, a proliferation comparable to the intense proliferation described by Bolsi in his case. Reactive manifestation of the microglia is also met in association with areas where giant cells of glial or nerve nature are prominent (Fig. 18).

In addition to the neuroglia changes scattered all over the involved convolutions there is another type of reaction of the glia tissue which is more of a nodular type and which consists in the

appearance here and there of small rather well circumscribed nodules, in some instances detectable to the naked eye. In such nodules with a definite tumoral structure there is an accumulation of cells of the neuroglia series. Fig. 19 illustrates one of such nodules in which spongioblasts, astroblasts and astrocytes are intermingled in a tissue rich in glia fibrils. Connective tissue is also present in increased amount. Such nodules may be safely considered as small gliomas.

As for the nodules found along the ventricular walls and which in some instances appear as somewhat pedunculated masses of various size, they often disclose a peripheral area in which the glia fibrils are considerably numerous surrounding a central area where in contrast the cellular elements are prominent (Fig. 20). The cellular portion contains in various amounts a mixture of cells of neuroblastic and spongioblastic origin.

The reaction of the fibrous glia is also of considerable importance. In the cortex it is particularly noticeable all along the molecular layer where it develops into a marginal gliosis (Fig. 21-a) and along the most inner layer where the gliosis, though not too intense is more diffuse. Between the molecular layer and the most inner ones there generally is an area definitely free from fibrous glia reaction. In the marginal layers of the cortex the proliferated neuroglia fibers appear in some instances as a cap, covering the cortex (Fig. 21-b). Whirlwind formations of glia fibrils are condensed in such caps. Underlying the cap, the process of cortical gliosis is more intense than in the surrounding areas. The scarcity of the reaction in the middle layers of the cortex may be the result of a normal paucity of glia fibrils in such areas. Proliferation of glia fibrils is also encountered in the subependymal layer particularly in the very small ventricular nodules (Fig. 22).

Myelin Sheaths: In correspondence to the sclerotic areas there is a considerable destruction of myelin sheaths, generally patchy in distribution. Here and there, however, a diffuse demyelinization is encountered involving larger areas of the white substance. Fig. 23 illustrates the occurrence of a severe patchy type of demyelinization corresponding to areas where the proliferation of glia tissue is pronounced. Fig. 24 illustrates a more diffuse type of demyelini-

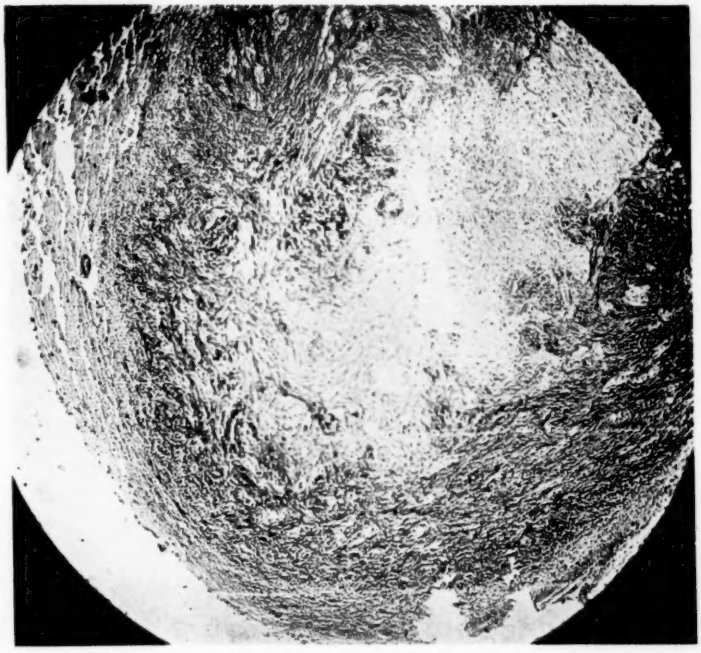
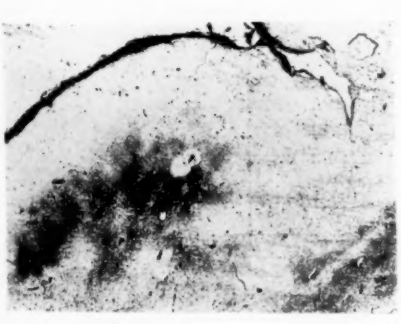


Fig. 20. Nodular mass in the lateral ventricle disclosing a peripheral portion formed by glia fibriles. Mallory's ethyl Violet Orange G



Figs. 21-a and 21-b. Very marked marginal gliosis which in 21-b involves the various cortical layers. There is in addition a definite cap-like formation in which whirl wind structures of glial nature are pressed together.
Holzer's method for gliafibrils

UNIV. OF MICH.

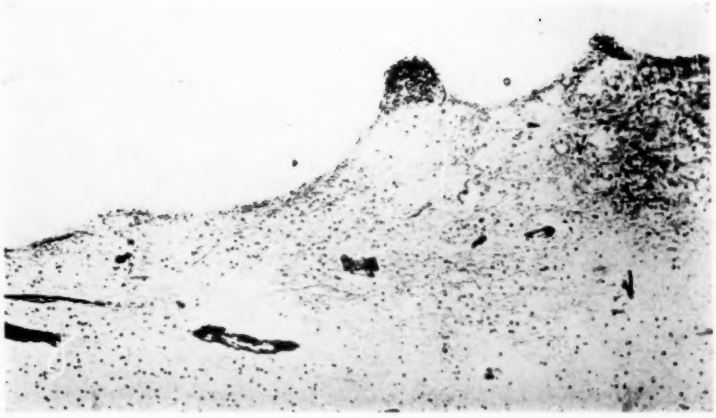


Fig. 22. Very small nodule of the ventricular cavity showing considerable proliferation of glia fibrils. Holzer's method for gliafibrils

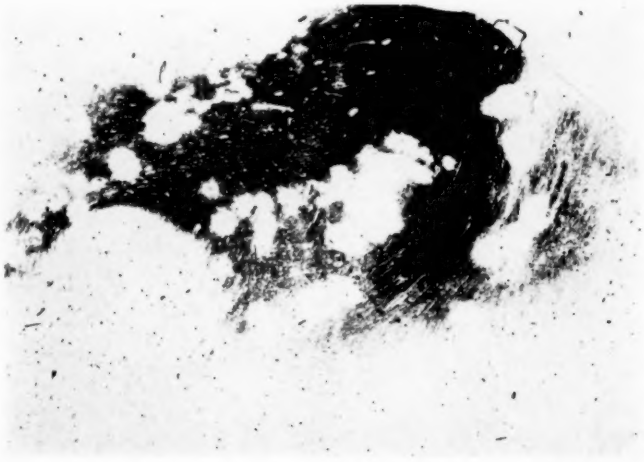


Fig. 23. Areas of demyelinization in the white matter and at the periphery of white and gray matter. Spielmeyer's method for myelin sheaths

UNIV OF MICH.

Fig. 24. Diffuse process of demyelinization in the white substance. Spielmeyer's method for myelin sheaths

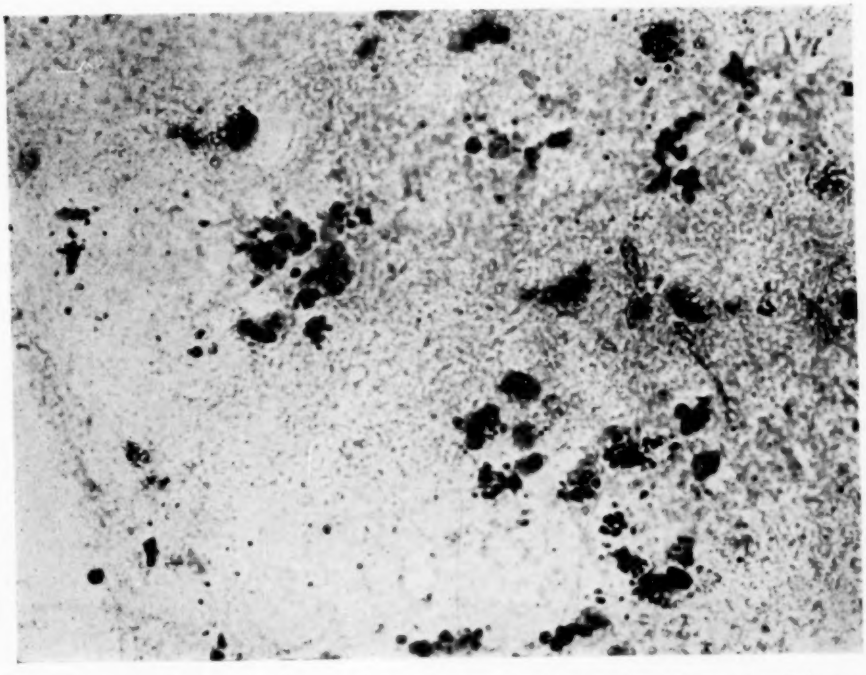


Fig. 25. Accumulation of fat products of degeneration in glia elements and increase of lipoid material in some of the nerve cells. Sharlach R for fat

UNIV OF MICH.

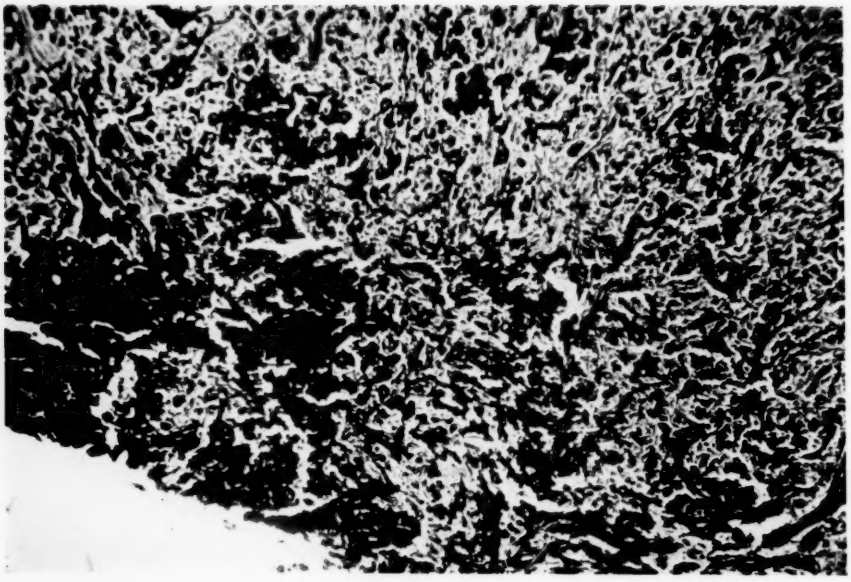
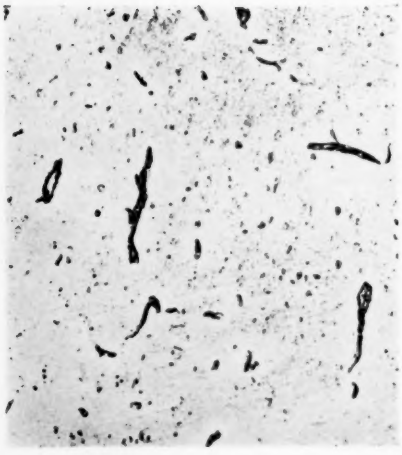


Fig. 28. Diffuse calcareous degeneration in a nodular mass of the lateral ventricle H. and E. stain



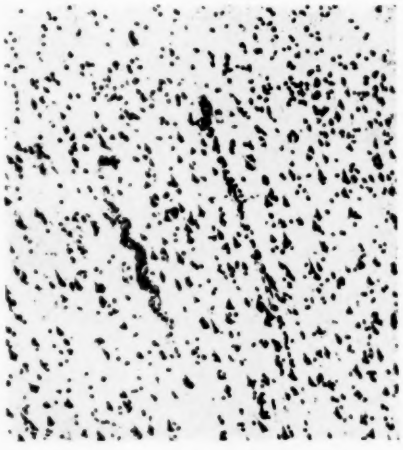


Fig. 29-a. Thickening of the blood vessel wall. Perdrau's method for Connective Tissue
Fig. 29-b. Hyperplasia of the endothelial elements of the intima in some of the cortical vessels. Nissl stain

UNIV. OF MICH.

Fig. 26. Accumulation of fat products of degeneration in the vicinity of the blood vessels and embedded in some of the cellular elements of the blood vessel walls

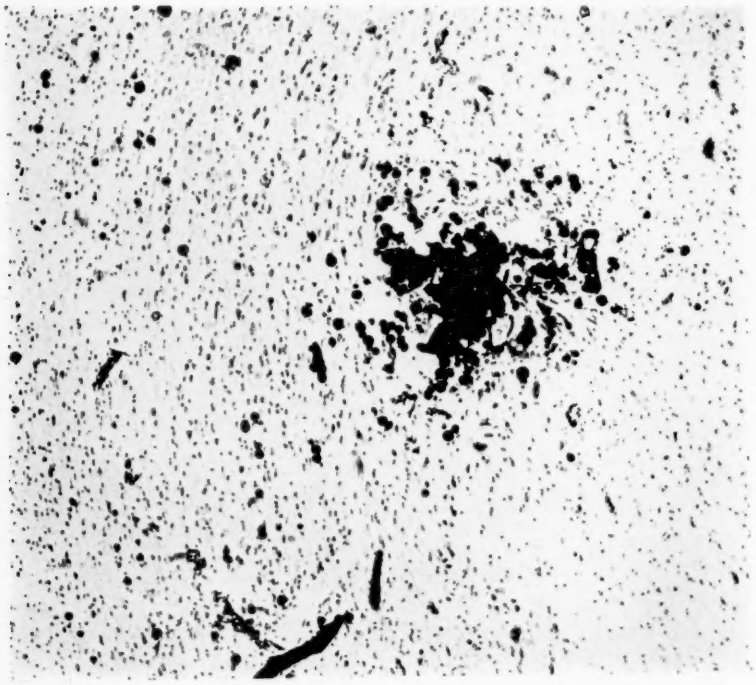


Fig. 27. Nodular area of calcification in the white substance. H. and E. stain

UNIV OF MICH.

zation. Involvement of the myelin sheaths is also noticeable in areas where the sclerosis is not grossly detectable. In all the involved areas all stages of destruction of myelin involvement are seen from swelling and fragmentation to granular disintegration. In the most involved sectors the destruction of the myelin is complete and the process results in large unstained areas.

Fatty Products of Degeneration: A considerable amount of fat products of degeneration is encountered all over the gray and white matter. The fat is seen to occupy the cell body of the microglia elements. Oligodendroglia cells are also seen, loaded with fatty material. The distribution of fat occasionally covers a considerable area of the section (Fig. 25). Nerve cells may often be seen loaded with excess of lipoid material. Cellular elements of the blood vessel walls, particularly the endothelial cells are also seen loaded with fat (Fig. 26). In addition, fat material is also found free in the perivascular spaces.

Calcification: Calcified products of degeneration are often found. The deposits of such material may be located in the midst of the white or the gray matter. They occupy the cell body of various types of cells, some of which are distinctly recognizable with appropriate method as being oligodendroglia cells. At times, the collection of the calcified material assumes the aspect of a nodular formation surrounded by additional particles scattered in the adjacent tissue (Fig. 27).

In the tumoral masses of the ventricular cavities, particularly in the large ones, the calcium deposits may assume a conspicuous appearance and occupy a large portion of the sectioned area (Fig. 28).

Blood Vessels: The small blood vessels show a definite though not marked thickening of their walls including the intima. Fig. 29-a illustrates the thickening of the capillaries of the cortex as detected by the Perdrau method for connective tissue. In Fig. 29-b hyperplasia of the endothelial elements is illustrated (Nissl stain). Thickened vessel walls are particularly found in the sclerotic masses and in the neoplastic structures. There, the connective tissue network is extremely abundant. In addition to the thickening of the blood vessel walls there is a certain increase in the number of the

small blood vessels, particularly pronounced in the most involved areas.

Pia: The pia mater shows here and there evidence of thickening. Microscopically there is a definite cellular increase of connective tissue elements with a large number of endothelial cells and chromatophores. In some areas there is a considerable number of phagocytic cells of mixed origin, the presence of which is quite indicative of a progressive degenerative condition (Fig. 30). No elements are seen pointing to the inflammatory nature of the proliferated cells.

Brain Tumors in Association with Tuberous Sclerosis: The two last cases of our series disclosed at the gross examination of the brain the association of definite lesions of tuberous sclerosis with neoplastic tissues as a result of which hydrocephalus was found. In both cases, there are elements in the clinical history pointing to the existence of cerebral neoplasms (focal lesions, vomiting, drowsiness, etc.).

In the first case (No. 16 of our series) the mass of neoplastic tissue is illustrated in Fig. 31 and is seen occupying the endoventricular area, dorso-medial to the striothalamic region. Another small mass is seen embedded in the occipital area. In both areas, calcification and hemorrhages are seen. The histological study of the neoplastic tissue reveals a tumor the structure of which differs at various levels. The structure of the areas illustrated in Fig. 32 in which cellular elements are disposed in pseudo-rosette-like formations, recalls more the structure of an ependymoma. Other areas as the one represented in Fig. 33 have a structure recalling one of the spongioblastoma multiforme loaded with giant cells. In other areas again, particularly those very close to the inner portion of the ventricle, the structure of ganglioneuroma is found. Figs. 34-a and 34-b illustrate cellular elements, the nature of which is evidently one of nerve cells. The confirmation of their nerve cell nature is given by Figs. 35-a and 35-b where the Bielschowsky method for neurofibrils reveals the existence of a definite neurofibrilar apparatus. In the last-mentioned areas the reaction of the connective tissue is quite marked.

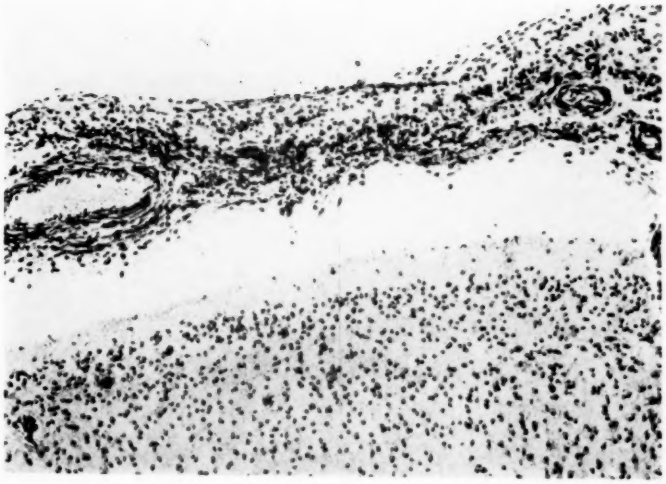


Fig. 30. Proliferation of phagocytic cells loaded with fat tissue of degeneration in the pia

Fig. 31. Tumoral growth in the striato-thalamic region. Small nodular mass of the same nature in the lateral wall of the lateral ventricle. In both the tumoral growths note the small hemorrhages

UNIV. OF MICH.

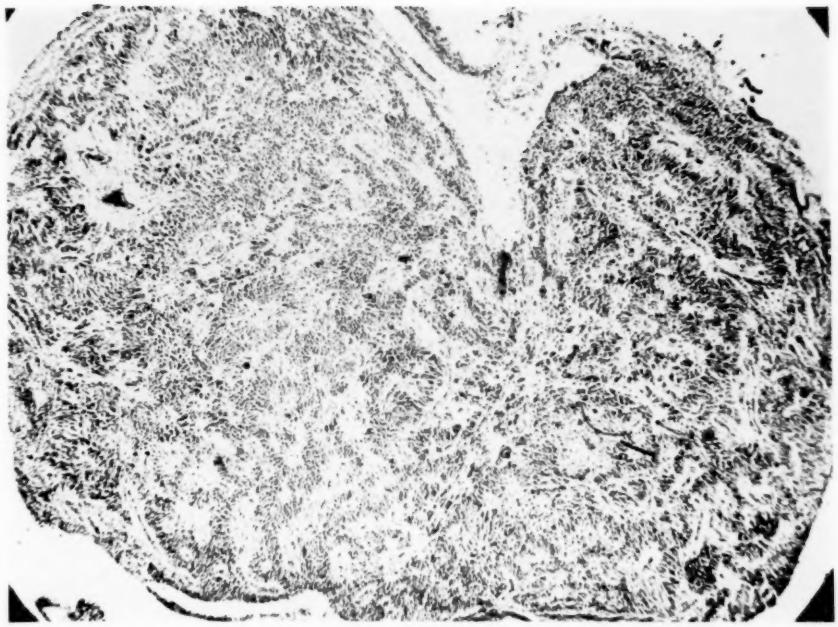


Fig. 32. Pseudo rosette-like disposition of cells recalling the structure of ependyoma. H. and E stain

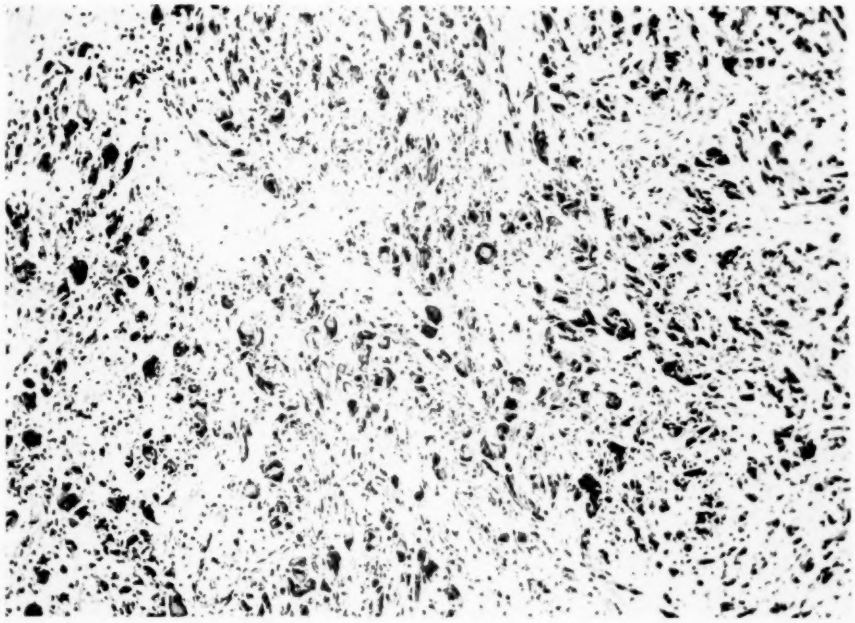
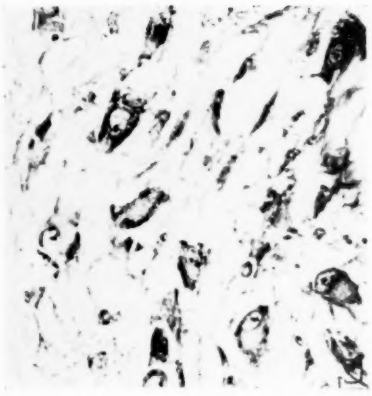
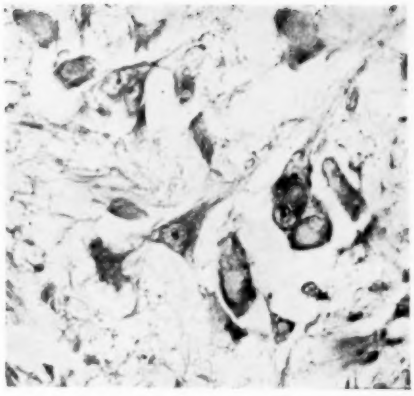


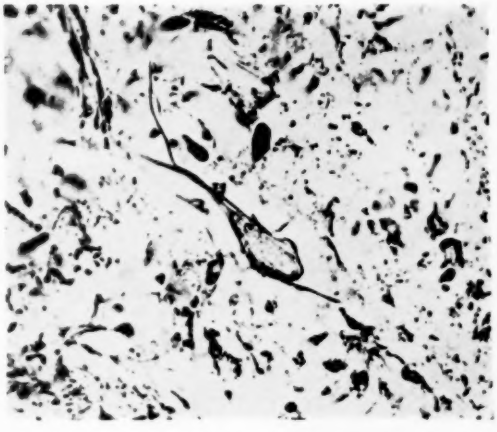
Fig. 33. Numerous giant cells of glial nature found in the tumors where the structure recalls one of spongioblastoma multiforme. H. and E. stain

UNIV. OF MICH.





Figs. 34-a, 34-b. Cells of the neuronal series found in the midst of the tumoral masses. Nissl stain



Figs. 35-a, 35-b. Neurofibrillar structure in some of the cells of the neuronal series found in the same tumors. Bielschowsky's method for neurofibrils

UNIV. OF MICH.

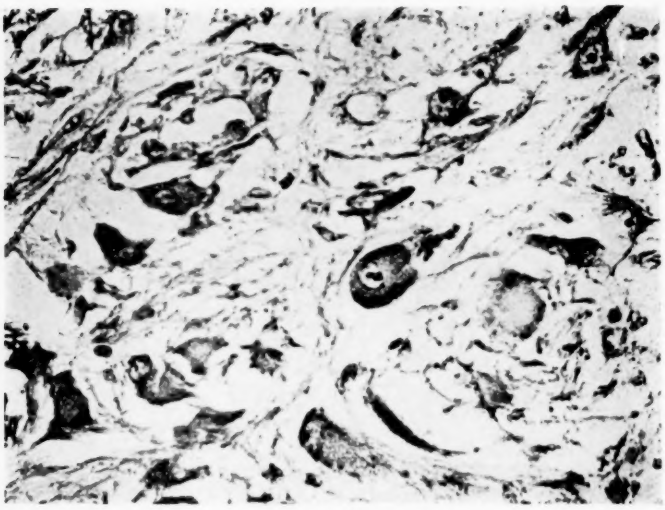


Fig. 37. Cells of neuronal series found in the midst of the tumoral mass. Nissl stain

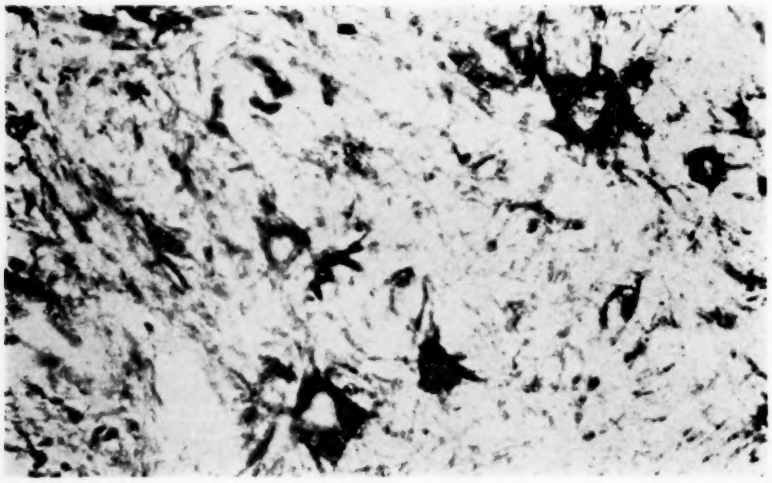


Fig. 38. Cells of the spongioblastic series found in the same tumors. Cajal's Gold Sublimate method for glia cells

UNIV. OF MICH.

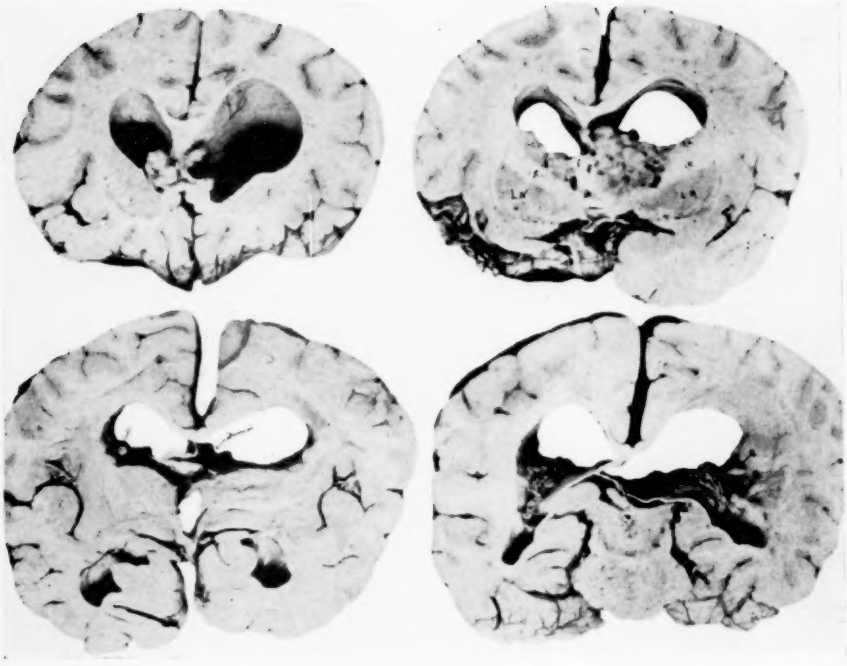


Fig. 36. Cross section of the brain of case No. 17 disclosing the hydrocephalus and the growth of two tumoral masses one of which is of considerable development in the right striato-thalamic region

UNIV. OF MICH.

In the second case (No. 17 of our series) two tumoral masses are found in a location quite similar to case No. 16. The mass seen in the lateral ventricle of the right side of the picture (Fig. 36) is quite large and its interference with the foramen of Monro is manifested by the resulting hydrocephalus.

In this case the histological study of the neoplasm reveals also a mixed type of tumor in which both glia and nerve cell elements are intermingled. Fig. 37 illustrates the histological appearance of some of the neuroblastic elements of the cells contrasting with some glioblastic elements seen in Fig. 38.

In addition to these tumoral masses which in cases Nos. 16 and 17 are evidently definite brain tumors from both the clinical and histological standpoints, we have found in our material other cases in which nodules of the ventricular walls were of important size. In some of the nodules, the histological features were similar to the larger tumoral masses in the sense that elements of both the neuroblastic and spongioblastic series were present. Altogether, therefore, from the very small nodules to the definitely large masses all kind of gradations may be found all pointing to the neoplastic nature of the nodular process. The very small nodules seem to be dominantly glial in nature, whereas the larger ones are more of a mixed type.

The histological study of some of the tumoral masses found in the spleen and liver, and in the kidneys of most of the cases, definitely point to their neoplastic nature. Here, also we are dealing with a neoplastic process of the mixed type in which parenchymatous elements are intermingled with connective tissue elements or other elements of the supporting system (myosarcomas, liposarcomas, fibro-liposarcomas).

V. Discussions

The various cases which have been histologically studied seem to point to the fact that the pathogenesis of tuberous sclerosis is hardly consistent with the one advocated by Pellizzi as a "histioatypia disseminata." Bielschowsky, in an early work advocated with considerable justification the neoplastic nature of the process. Later on, however, he changed his previous view and expressed

himself more favorably towards a mixed conception in the sense that the disease should be considered a mixture of abnormal development and neoplastic tendencies, that is, a condition of malformation with additional neoformation.

The documentation brought forward in our material does not seem to favor a dual conception. As a matter of fact we have very few facts at hand to uphold the conception of a malformation. In the brain tissue itself, very little is found to support such a view. The appearance of the cerebral convolutions including the primary, secondary and tertiary sulci does not seem to point to a basic malformation.

On the contrary, the histological study of the areas where the sclerotic process appears in the form of tuberosity or in the more diffuse area of gliosis we feel shows enough elements to consider the process one of a neoplastic nature. The disturbed architecture which some authors have emphasized in support of the conception of a histioatypia seems to us the result of a process of glia replacement of nerve cell elements undergoing progressive and degenerative changes. It naturally follows that proportionately to the destroyed cells an abnormal appearance of the cytoarchitecture must result.

On the other hand, the presence of monster nerve cells does not very well fit with a process of histioatypia, but seems to us more in accordance with a process in which stimuli of unknown origin have been at work and may still be at work, leading to the hypertrophy of the cellular structures. Enlarged elements do not, in our opinion, necessarily carry the conception of dysembryogenesis, especially in view of the fact that we have the same gigantic appearance in the neuroglia cells. On the other hand, reactive manifestation of the astrocytes leading to the formation of monster glia cells is found in connection with other degenerative and neoplastic processes.

Another point in favor of the neoplastic conception of tuberous sclerosis is the occasional presence in the inner cortical layers of nodules of various size (Fig. 19), the neoplastic nature of which cannot be denied. We do not see how such nodules should be considered the expression of abnormal histogenesis and not of real

neoplasm. If the theory of histioatypia should apply to the pathogenesis of such nodules we would find ourselves obliged to extend such explanation to most of the cerebral neoplasms. It would be forcing quite strongly the issue to consider all neoplastic processes the expression of disembryogenesis. Neoplastic processes carry with them the proliferation of embryonic elements but do not necessarily indicate important primary disturbed embryogenesis.

To use the presence of embryonic elements in support of the theory of a disturbed embryogenesis is a poor argument as it will have to confute the neoplastic tendencies of the central nervous system, of the skin, and of the various other organs manifesting neoplasms.

Conversely, the association of tuberous sclerosis and brain tumor is another point in favor of the neoplastic substratum of the whole pathological picture. Such association of brain tumor and tuberous sclerosis has been pointed out by various authors: Kaufmann, Schuster, Berliner, Licen, von Meduna, etc., and more recently by Globus, Selinsky and Strauss.

The fact that some of the recently reported neoplasms in tuberous sclerosis are of a mixed nature and are fundamentally constituted of both nerve and glia cell elements is another point in favor of the unity of the process underlying (a) the formation of the tumoral masses, (b) the collections of proliferated nerve and glia cells and (c) the hypertrophy of individual cells scattered in the various areas of the brain.

It is possible to expect that as a result of stimuli acting diffusely over elements in maturation, an increase of their size and of their number may follow, and that the normal cellular arrangement of the cortex may suffer consequently. It also follows that the apparent histioatypia does not have to represent the primary fundamental change but may very well be the effect and not the cause.

For some authors the so-called heterotopias consisting of nerve cells in the white matter constitute a point in favor of the disembryoplastic origin of the process.

We feel that such an assumption is carried somewhat too far. We base our feeling on the fact that even in normal brains, nerve cells are found here and there in the white substance (internal

capsule—corona radiata). Such cells may very well originate from indifferent cells which we feel may be present at all times of the embryonic development and possibly later on, after the development has taken place. Such indifferent cells of Schaper, which correspond to the medulloblasts of Cushing and Bailey are apt, under the influence of pathological stimuli, which may have nothing to do with the development of the brain, undergo changes toward maturation into a glia cell or a nerve cell.

Such a possibility is substantiated by a case which one of us has described in collaboration with Dr. Barrera in which the abnormal development of indifferent cells not only during fetal life but later on in puberty resulted in a diffuse medulloblastosis, with definite neoplastic tendencies.

It is possible, therefore, that the neoplastic stimuli responsible for the tumoral appearance of tuberous sclerosis may in turn influence the further development of indifferent cells, thus being responsible for the appearance of nerve cells in areas where normally they are absent. It is not a disembryogenetic process but a neogenetic one.

The nature of the stimulus responsible for the neoplastic tendencies of the parenchymatous elements still remains a problem to be solved.

It seems probable, however, that whatever the agent may be, it must still be active after birth, as in some cases, particularly in the case described by Bolsi and in two of our cases, the microglia reaction was definitely of the progressive type pointing to a still active process. Moreover, the areas of demyelinization in which large fragments of myelin are encountered, in addition to the presence of diffuse fatty products of degeneration in the cortex and in the white matter are all evidence in favor of the progressive course of the disease.

Finally, the fact of the existence of various types of tumors, in the heart, liver, spleen and kidney seems to support the conception of a diffuse blastomatosis.

The coincidence of general abnormalities of development described in association with tuberous sclerosis of the brain does not necessarily imply that the pathogenesis of the process is a malfor-

mation. It may possibly be that in some instances because of the pathological changes of some of the most important cerebral regulating centers, the development of some organs may be inadequate and result, therefore, in abnormal aspect.

As for the time of appearance of the cerebral lesions, the abnormal stimuli undoubtedly act during the development of the nervous system, but not necessarily as generally accepted after the seventh or eighth months of intrauterine life. The fact that some of the pathological elements involve the tertiary sulci is not enough to establish the origin of the pathological process as related to the period of formation of such tertiary sulci. There is nothing in fact to establish that the pathological changes need necessarily result in the involvement of the main sulci. It may well be that abnormal stimuli act gradually and very slowly on the nervous elements during their development, without necessarily interfering with the formation of the fundamental pattern of the brain, as represented by its main sulci and convolutions. Furthermore, we have found in our material primary and secondary convolutions involved by pathological changes, a fact which would necessarily call for an earlier development of the pathological process.

The fact that a certain pathological process develops during the intrauterine period of life does not necessarily carry with it the conclusion that this process must represent a primary maldevelopment. The abnormal development of the brain may be the result of the primary pathological process and therefore should not represent the label by which to define the disease. Because of the definite neoplastic tendencies of the various elements which in some cases go as far as to form definite brain tumors, we are inclined to believe that the process is akin to the one which is at the base of other types of brain neoplasm. It follows, therefore, that the fundamental process in tuberous sclerosis is a neoplastic one and because of the fact that both glia cells and nerve cells are involved, leading to the formation of neurospongioblastomas, we feel inclined to consider the basic pathological condition one of "diffuse neurospongioblastomatosis."

Such a conception, already expressed by Globus, Selinsky and Strauss in the review of the 11 cases of brain tumors in association

with a typical or abortive type of tuberous sclerosis, seems to receive a confirmation from our histological investigation.

A question now arises as to the time in which some of the neoplastic structures in tuberous sclerosis will in a given case reach the growth of a definite tumoral mass. Because of our impression that tuberous sclerosis is a progressive condition it seems to us difficult to decide if the tumoral masses which at times accompany the diffuse manifestations of tuberous sclerosis are formed very early in the course of the disease or if their development begins at the time when clinical manifestations point to the existence of an intracranial neoplasm.

It might well be that tumoral growths accompanying tuberous sclerosis are followed by less severe clinical manifestations than the tumors occurring in a more advanced period of life. It might well be that the immature nervous system has a greater power of adaptation to the presence of an abnormal morphological situation, whereas in a more mature brain the sudden growth and multiplication of new cells may result in more severe pathological reaction and clinical manifestations.

BIBLIOGRAPHY

1. Bourneville, D.: "Sclérose tubéreuse des circonvolutions cérébrales; idiotie et épilepsie hémiplégique." Arch. de Neur., 1:1880-81, 81.
2. Brissaud, E., and Bourneville, D.: "Encephalite ou sclérose tubéreuse des circonvolutions cérébrales." Arch. de Neur. 1:1880-81, 397.
3. Pellizzi, G.: "Contributo allo studio dell'idiozia." Riv. sperim di Freniat., 27:1901, 265.
4. Vogt, H.: "Zur Pathologie und pathologischen Anatomie der verschiedenen Idiotieformen. Tuberöse Sklerose." Monat. f. Psych. u. Neur., 24:1908, 106.
5. Bielschowsky, M.: "Ueber tuberöse Sklerose und ihre Beziehungen zu Recklinghausenscher Krankheit." Zeit. f. d. g. Neur. u. Psych., 26:1914, 133.
6. Bielschowsky, M.: "Zur Histopathologie und Pathogenese der tuberösen Sklerose." Journ. f. Psych. u. Neur., 30:1924, 167.
7. Bielschowsky, M., and Gallus: "Ueber tuberöse Sklerose." Journ. f. Psych. u. Neur., 20:1913, 1.
8. Bielschowsky, M., and Rose, M.: "Zur Kenntnis der zentralen Veränderungen bei Recklinghausenscher Krankheit." Ibid, 35:1927, 42.
9. Bielschowsky, M., and Freund: "Ueber Veränderungen des Striatums bei tuberöse Sklerose und deren Beziehungen zur den Befundenbei anderen Erkrankungen dieses Hirnteils." Ibid, 24:1918, 20.
10. Babonneix, L.: À Propos de la Sclérose Tubéreuse. Revue Neurologique. Vol. 34:1918, 17.
11. Babonneix, L.: À Propos de l' épiloia." Arch. de Med. des. Enf., 31:1928, 133.
12. Bonfigli, F.: "Ueber tuberöse Sklerose." Monat. f. Psycho. u. Neurol, 27:1910.
13. Perusini, G.: "Ueber einen Fall von Sclerosis tuberosa hypertrophica (istioatipia corticale disseminata von Pellizzi)." Monat. f. Psycho. u. Neur., 17:1905, 169, 255, 352.

14. Cavazzani, S.: "Un caso di sclerosi tuberosa ipertrofica della corteccia cerebrale." Arch. p. le Scienze Mediche, 1902.

15. Bolognesi, G.: Gliosi Cerebrale. Tuberosa Subependimale in Soggetto Melanconico. Riv. di Patologia Nervosa e Mentale, 11:1906, 348.

16. Nieuwenhuijse, P.: "Zur Kenntnis der tuberösen Hirnsklerose und der multiplen Neurofibromatosis und über die behauptete enge Verwandtschaft dieser beiden Krankheiten." Ziet. f. d. ges. Neurologie and psychiatrie, 24:1914, 53.

17. Freeman, W.: Tuberose Sclerosis. Arch. of Neurol. and Psychiat., 8:1922, 614.

18. Desogus, V.: Contributo allo studio della sclerosi tuberosa. Riv. di pat. Nerv. e Ment., 1923.

19. Brushfield, T., and Wyatt, W.: Epiloia. Brit. Journ. of Children's Diseases, 23:1926, 178.

20. Licen: Sclerosi tuberosa e tumore cerebrale. Riv. sperim. di freniatria, 1927.

21. Bolsi, D., and DeBenedetti, E.: Un caso di sclerosi tuberosa. Rassegna di Studi Psichiatrici, 19:1930, 571.

21a. Bolsi, D.: Contributo all'istologia patologica cerebrale della sclerosi tuberose. Riv. di Patologia Nervosa e Mentale, 33:1928, 671.

22. Meduna, L. V.: Tuberöse Sklerose und Gliom. Zeit. f. d. ges. Neurologie und Psychiatrie, 129:1930, 679.

23. Yakovlev, P. I., and Guthrie, R. H.: Congenital Ectodermoses (Neurocutaneous Syndromes) in Epileptic Patients. Arch. of Neurol. and Psychiat, 26:1931, 1157.

24. Critchley, M., and Earl, C. G. C.: Tuberose Sclerosis and Allied Conditions. Brain, a Journ. of Neurology, 55: Pt. 3, 1932, Chap. 3, 4.

25. Mattirolo, G., and Zorini, O.: Note Sopra Un caso di Sclerosi Tuberosa del Cervello. Minerva, Medica, 6:1926, 289.

26. Globus, H. J., Strauss, I., and Selinsky, H.: Das Neurospongioblastom eine primäre Gehirngeschwulst bei disseminierter Neurospongioblastose (tuberöse Sklerose). Zeit. fur die ges. Neurologie und Psychiatrie, 140:1932, 1.

27. Kaufman: Quoted by Licen (20).

28. Schuster, P.: Beitrag zur Klinik der tuberösen Sklerose. Deutsche Zeitschr. f. Nervenheilk, 50:1914, 96.

29. Berliner: Tuberose sklerose und Tumor. Beitr. z. pathol. Anat. u. z. allg. Pathol. Bd., 69, 1921.

30. Licen, E.: Loc. Cit., 20.

31. Meduna, L. V.: Loc. Cit., 22.

32. Ayala, G., and Sabatucci, F.: Klinischer und pathologisch-anatomischer Beitrag zum Studium der zentralen Neurofibromatose. Zeit. f. d. ges. Neurol. u. Psych. Bd., 103, 1926.

33. Orzechowski, K., and Nowicki, W.: "Zur Pathogenese und pathologischen Anatomie der multiplen Neurofibromatose und der Sclerosis tuberosa (Neurofibromatosis universales)." Zeit. f. d. g. Neur. u. Psych., 11:1912, 237.

34. Weber, F., Parkes and Perdrau, J. R.: "Periosteal Neurofibromatosis with a short consideration of the whole subject of Neurofibromatosis." Quart. Journ. Med., 23:1930, 15.

35. Gumper, E.: "Zur Kenntnis der zentralen Veränderungen bei morbus Recklinghausen." Journ. f. Psych. u. Neurol., 39:1928, 39.

36. Feriz, H.: "Ein Beitrag zur Histopathologie der tuberöse Sklerose."

37 Bielschowsky, M.: Loc. Cit.

38. Hoeve, J. Van der: "Augengeschwülste bei der tuberösen Hirnsklerose (Bourneville) und verwandten Krankheiten." Arch. f. Ophthalm, 111:1923, 1.

39. Nieuwenhuijse, P.: Loc. Cit., 16. c

40. Yakolev, P. I., and Guthrie, R. H.: Loc. Cit., 23.

41. Globus, H. J., Strauss, I., and Selinsky, H.: Loc. Cit., 26.

42. Olson, G. M.: Arch. Derm. and Syph., 1922, vi, 21.

43. Pringle: Quoted by Bolsi (21a).

44. Pasini, R.: Sul cosidetto adenoma sebasco (Pringle). Nevo fibromatoso angiectasico simmetrico del volto. "Giornale it. d. mal. veneree e. d. pelle," 1909, fasc. III.

45. Kopp: Quoted by Bolsi and de Benedetti (21).

46. Bushke: Quoted by Bolsi and de Benedetti (21).

47. Sherlock, E. B.: "The Feebleminded." Macmillan & Co., Lond., 1911.

48. Brain, W. R., and Strauss, E. B.: Epiloia, Recent Advances in Neurology. P. Blakiston's Son & Co., Philadelphia, 1929, 348.

49. Sailer, J.: "Hypertrophic Nodular Sclerosis." Journ. Nerv. & Ment. Dis., 25:1898, 402.

50. Campbell, A. W.: "Cerebral Sclerosis." Brain, 28:1905, 367.

51. Josephy, H.: "Zur Pathologie der tuberösen Sklerose." Zeit. f. d. ges. Neurol. und Psychiat., 67:1921, 232.

52. Kirch-Hertel. Maria Pie: Tuberöse Hirnsklerose mit verschiedenen Missbildungen und Geschwülsten. Pathologisches Institut Würzburg. Zbl. Path., 33:1923.

53. Pollack, E.: Ueber tuberöse Hirnsklerose. Arb. Neur. Inst. Wien, 24:1922.

54. Bouwdijk, Bastianse, F. S., and Landsteiner, K.: Eine familiäre Form tuberöser Sklerose. Nederl. Tijdschr. v. geneesk, "66:1922 Abstracted in Zentralbl. f. d. ges. Neur. u. Psych." Bd. 32:1923.

55. Kirpicznik, Joseph: Ein Fall von tuberöser Sklerose. Virchows Arch., 202:1910, 358.

56. Fabing, H.: Tuberous Sclerosis with Epilepsy (Epiloia) in Identical Twins. Brain, 57:1934, 227. Part 3.

57. Hartdegen, A.: Ein Fall von multipler verhärtung des Grosshirns nebst histologisch eigenartigen harten Geschwülsten der Seitenventrikel (Glioma gangliocellulare) bei einen Neugeborenen. Archiv f. Psych., XI, bd., 1881.

58. Bruckner, O.: Ueber multiple, tuberöse Sklerose der Hirnrinde Ein Beitrag zur patholog. Anatomie der Idiotie. Archiv für Psych. u Nervenkr., XII, B. H., 3.

SIMULATED FOOLISHNESS AND MENTAL PUERILISM IN THE PSYCHOSES

BY POMPEO MILICI, M. D.,
SENIOR ASSISTANT PHYSICIAN, KINGS PARK STATE HOSPITAL

The mental trait of childishness is often carried over into a psychosis to color it with childish manifestations and with the symptoms of foolish, silly behavior. Most commonly is this to be observed in the oligophrenias. The organic dementias also show an abundant variety of puerilistic features, and such symptoms may appear occasionally to arise on the basis of a toxic-infectious process. The syndrome of childlike and foolish behavior may be elicited by hypnosis. But it is in the hysterical states that its occurrence has received the greatest attention; in hysterical states where there has occurred a regression of the libido to the childhood era; a regression brought about by repression of the disagreeable situation (generally an experience heavily laden affectively and of a sexual nature) along with its associative connections from consciousness. The process goes too far and, except for the experience of early childhood, the patient forgets almost everything. The only remaining "later" memories are usually the pleasant ones; the disagreeable memories are most difficult to be recalled.

The elucidation of the important part played by "repression" (Verdrängung) in forgetting (Vergessen), both in everyday life and in abnormal mental states, is one of Freud's most noteworthy contributions to psychology. The mechanism of forgetting is now well understood as a defence against painful or disagreeable memories and experiences. While it is often made operative by a painful mental process (Unlust) of which the subject is temporarily or permanently unaware, it occurs also in the face of situations frankly disagreeable.

One cannot, in discussing psychogenetic causal factors of the psychoses, neglect the associated biophysical reactions of the individual. Nevertheless in certain types of psychoses the preponderant importance of psychogenesis seems to be established.

The reaction disturbances which make up the "prison symptom complex" are very clearly related to the immediate situation. The

prisoners seek self-defence by withdrawing behind a psychic upheaval of symptoms generally hysterical in character—wish-fulfilling delusional trends and hallucinations, acute confusional, stuporous states, amnesic gaps and Ganser behavior—but also at times closely simulating the malignant psychoses, through a prolongation of course and peculiarity of features.

Though often there is a magic-like clearing up of symptoms upon the removal of the unbearable causative factor, these symptoms are not the product of deliberate simulation, of conscious deception. These are "purpose psychoses," in which "it can scarcely be questioned that the content of the psychosis represents conflicts and reactions to conflicts which the individual, owing to an inherited constitutional deficiency, has been incapable of handling adequately." (Hoch[1]) The symptoms arise in the unconscious, are symbolic distorted expressions of the fulfillment of repressed wishes, and have a definite meaning for the patient.

The patient reverts to the helplessness and complete irresponsibility of the childhood and even infantile period. He wants to be taken into bed with the mother and nursed by her. He has to be washed, clothed, fed and otherwise cared for as a child is cared for. He becomes moody, sulky, timorously resentful, he refuses to speak and lies about quietly in curled-up postures. Or he may appear to be in excellent contact, showing childlike curiosity of the environment. He may notice children's voices, and amuse himself with things that amuse children. He teases those about him to the extreme with apparently purposeless naughtiness and wanders restlessly about singing and whistling, exhibiting exceedingly foolish and childish behavior, with childlike fears, attacks of inconsolable weeping and showing uncomprehending attitudes and abysmal stupidity in replying to the simplest of questions with an infantile vocabulary and mode of utterance. This is the syndrome which has been called *ecmnesie* by Pitres,[2] and *puérilisme mental* by Dupré,[3] while Janet[4] speaks of a *retour à l'enfance*. Characteristically there is upon recovery an amnesia for the episode.

This syndrome, observable among civilians "in the ordinary course of events," was noted with increasing regularity during the World War in recruits and conscripts, arising on the basis of a wish

to be relieved from active trench duty (called "anticipation neurosis"[5]; in soldiers undergoing punishment, the purpose of the symptoms to effect a flight from reality and into disease, to escape the unbearable present, to live again in the security of the past; more particularly, in soldiers who had been under fire by high explosives. In the latter instance, of course, in the majority of cases, commotional and emotional forces were associated, organic lesions intermingled with functional disturbances and often difficulties were encountered in attempting to evaluate the part played by each. But in cases exhibiting central nervous system affection without external injury the psychogenetic etiology was soon revealed. The "war psychoneuroses" received deserved attention and gratifying results were then obtained by psychotherapy.

The war was not found to have created anything new in psychic symptomatology, the war environment merely replacing peace-time situations in eliciting identical syndromes in predisposed individuals. The war experiences simply corroborated the fact that psychic shock could bring about reactions ranging from mild psychotic episodes to severe and even permanent psychoses. Glueck[6] compares the transitory loss of well-studied knowledge because of fear by students undergoing examination to the symptoms of pseudodementia exhibited by soldiers under stress.

These clearly psychogenetic, reactive, emotional disturbances present in general, then, the following features: the psychotic upset is sudden in onset; the psychosis appears to be definitely the result of the immediate stress and a means of avoiding the stress; recovery usually follows removal of the disagreeable setting. Prisoners recover on being sent away from prison to mental hospitals, away from the immediate threat of the electric chair. Hysterical contractures, paralyses, amnesias belied the original diagnosis of organic pathology by disappearing completely in safe environments. A return of symptoms followed a return to the situation which had precipitated them.

A fairly typical example of simulated foolishness in hysteria is presented in the following case: The patient, J. D., an Italian female, was born in Sicily in 1904. The family history is said to be negative. From her arrival in the United States in 1920 until her

confinement she was steadily employed as a sewing machine operator in a dress factory. She was intelligent and of an open social makeup. Married when 20 years old, she separated from her husband in 1927 and she is without offspring. Psychosis: she was considered "normal" until early May, 1931, when she fell at her place of work, striking her head. Momentarily stunned, she was yet able to proceed alone to her home by subway. But immediately there she complained of very severe headache and dizziness. She could not sleep, and her behavior alternated between very quiet seclusive attitudes, inconsolable weeping, excited outbursts when she laughed uproariously, sang operatic airs and broke dishes, and episodes when she played like a child with young children. She appeared then to become increasingly confused, readily forget what she did, where she had placed objects. Her thoughts were retarded and difficult to elicit. She had to be repeatedly questioned and she answered that her head was mixed up and that she did not remember anything.

Kings Park State Hospital—admitted July 20, 1931. She was unable to give an account of self. She insisted that she could not recall her birthplace, her birthday or age, the names of her parents or siblings, or any of the details of her school years, of her arrival in this country, or of her marriage. She could not give her address, or state the year or month. She believed the hospital to be a prison. Even after many interviews she professed never to have seen her physician previously. She could recall nothing of her work or accident, or of the X-ray studies just completed. Frequently she requested permission to run out into the woods to remain until her memory returned. She could not remember things for more than a few seconds even after much repetition. She did not recognize members of her family when they visited her but except for name, could describe them accurately when they had gone. She spelled correctly fairly complicated words but could not perform even simple arithmetical problems, insisting 2 and 2, and 1 and 4 to add to 6, and she was able only in a slow and painful manner to count on her fingers. She complained of a continuous whirring musical note in her head and of hallucinations of screaming voices which did not talk. The physical examination was negative except for a "posi-

tive'' Rhomberg of characteristic hysterical origin, the patient allowing herself to fall quickly and heavily in any direction. After a few weeks of this behavior she admitted an intention to sue her firm heavily for the injury she had sustained.

On July 11, 1931, her memory returned dramatically after she had been told by her sister that she could not otherwise leave the hospital. She was now immediately able to give a detailed account of her life history (episodic upset excepted, a complete amnesia for this persisting), and laughingly she performed difficult problems with ease. She was paroled recovered on September 27, 1931.

In the psychosis proper it may also occasionally be seen that a frankly disagreeable situation is reacted to by a regression of the libido to the age when loving care formed the bulwark against an inimical outside world, and with symptoms of the syndrome of foolish behavior. Such a reaction was observed to occur during the second of three attacks of manic-depressive psychosis, manic type, suffered by a woman whom we shall call M. W.

Case: M. W. was born in Brooklyn in 1894 of German parents. One sister is psychotic. The patient completed grammar school then worked as sewing machine operator in a shirt factory until she married in 1913. She has four children, of ages from 13 to 20 years. Morphologically she is of pyknic type and psychologically she has been of a definitely extraverted makeup with numerous friends, frank and energetic behavior, and leading interests in women's clubs and civic welfare work. Her first commitment was to the Brooklyn State Hospital on August 31, 1922, one month after delivery of her last child. The psychosis was sudden in onset after she had witnessed a serious street accident. That night she could not sleep, said that her father had died and that she must bury him, and she became highly resistive and violent. At the Brooklyn State Hospital the physical examination was negative. She was restless, irritable, voluble, rambling, flighty and so disturbed at times that restraint was necessary. She was described also as being perplexed, with thinking difficulty and ''unreality complex,'' referring disconnectedly to visual hallucinations and appearing at times as though emerging from a delirious state. She improved rapidly, was paroled on January 6, 1923 and discharged July 6,

1923, diagnosis—manic-depressive, manic type; condition, recovered.

The patient remained well until December 12, 1932. On this day a daughter left the house without permission to attend a dance. The patient did not know her whereabouts and became increasingly tense as the early morning hours went by and the daughter did not return. Suddenly she began to scream and shout incoherently. She had attacks of laughter and weeping, said she could hear the birds singing and that she had the key to heaven. She walked about aimlessly with a crucifix tightly grasped and which she would not give up. She reached out into the air for things she thought she saw; she rushed barefoot out into the rain, and finally she insisted on climbing to the attic where she uncovered dolls long forgotten and sat upon the floor to amuse herself with them.

Kings Park State Hospital—Admitted by transfer December 17, 1932. She was unable to give a progressive account of her troubles. Most questions she left unanswered and her replies to others were irrelevant. Repeatedly she made the sign of the cross over the examiner, asking each time if he was Roman Catholic. Several times she prayed briefly to herself. She pointed again and again to various objects on the desk and questioned in a very childish way, "Is this bought and paid for?" Again and again she repeated "Do you know the second commandment—I am thy God, thou shalt not bear false witness against me." She said that God had appeared to her on the altar, that she saw him come out of the tabernacle, and she seemed to be unable to get away from these and other thoughts for they kept cropping up time after time. She had to keep reassuring herself that such and such things were so, almost in a manner identical with that of the compulsive neurotic. When the examiner repeated a statement that she had made she would insist, "No, that didn't happen to you, that happened to me, I said it," and though it would be explained to her many times that her statements were merely being repeated in her own words she was not satisfied until she was definitely assured that they were recognized to be her own statements. She insisted on shaking hands repeatedly with the examiner. Over and over she asked the same questions as though she was asking them for the first time, yet paid

little attention to questions asked of her. Repeatedly she gave her name. She said that God was talking to her, and that she wanted God to tell her who drew the pictures of the two donkeys in the dentist's office. She cried bitterly on several occasions, asking God to save her family, but her tears quickly dried up and her facial expression was generally calm and contented. However, her affect in reaction to matters pertaining to her family and the future seemed to be inadequate. She was not afraid or worried and she insisted that nothing troubled her. There was no subjective feeling of bewilderment or perplexity, no evidence of distrust, rather a complete confidence in the examiner. She volunteered often that she had "never committed suicide."

When questioned as to the facts of her remote and recent memory she stated that she could not think, and it was with great difficulty that a few relevant answers were obtained. She was able to perform only the three simplest problems.

She was cared for on a disturbed ward because of her overactivity, overtalkativeness and periods of noisy irritability and weeping. Here she repeated over and over to other patients, "Are you Catholic, do you know the second commandment?" always in a very childish way. Her attention was extremely distractible, more especially from without, but also from within.

Within a week she improved considerably though she was still very childish. She insisted she remembered nothing of the events which preceded and followed her commitment. She denied that God had ever talked to her while she was awake or that she had had visual hallucinations, and said that her only communications with God had occurred in recent dreams. If she had admitted that God talked to her, she said, she must have been in a dreamy state. She smiled easily and cheerfully and said that she could now concentrate well. Her attention was, however, still easily distracted. She named aloud the articles about her as she took notice of them. She freely misidentified persons. Suddenly she took off her shoe to show the examiner that her name was printed in it, her entire manner very childish. She asked naïvely if the examiner could read.

An unsuccessful attempt was made to perform an associational

test. The patient could not be made to understand what she was supposed to do, and she repeated the test words after the examiner even after the explanation was made many times, or she would spell the words. She was now asked not to do anything that was told her by the examiner; that if she was told, for example, to open her mouth, put out her tongue, shut her eyes, or make a fist, she was not to obey the order. Despite repeated explanation however she immediately carried out each order and then would say, "Well, you told me to do it."

She continued to improve steadily, gave up her childish behavior, said that she must have been very insane to have acted as she did, and she attributed her upset to worries over finances, too much hustle and bustle in her household and social activities, and finally she recollected also the acute precipitating factor of her daughter's making. On March 11, 1934, she was paroled, diagnosis manic-depressive, manic; condition, recovered.

She again made an excellent adjustment until knowledge of being pregnant acutely precipitated another upset. She insisted wildly that her daughter obtain a divorce though the latter was unmarried, called the committing physician by his first name and in the next breath demanded to know who he was; she was described as confused, perplexed, and dreamlike. Readmitted to Kings Park State Hospital on June 17, 1935, her symptoms were typically manic with almost complete absence of childish features of the above type and she was paroled October 2, 1935, diagnosis, manic-depressive, manic type; condition, recovered.

A regression of personality is of course very definitely a part of the symptomatology of dementia præcox, and according to Jung is brought about by the same lack of adaptation to reality in the sexual sphere that Freud showed to be characteristic in causing the development of neurotic symptoms. Jung[7] drew a close parallel between dementia præcox and certain neuroses, and indicated that in dementia præcox, the most bizarre and apparently meaningless behavior has a meaning for the patient, obscured by condensation and symbolization.

It seemed particularly interesting to note then, that in some patients regarded as suffering from dementia præcox a sudden psy-

chic shock has appeared to be the precipitating factor and that the reaction, including as it did a very distinctly childish and foolish behavior, did not seem to be far separate from that in the "purpose psychoses." The following cases are presented as illustration in point:

Case: R. B. was born in Bayonne, N. J., on October 8, 1899 of Hebrew parents. Her mother is described as asocial, suspicious, stubborn and hard to get along with, and one sister is insane. The patient's health in early childhood was poor; she was overprotected and pampered, became "spoiled," fussy, domineering and very headstrong, and she achieved the carrying out of her whims by resorting to temper tantrums. She grew up to be very shy, bashful, seclusive, secretive and sensitive, irritable, stubborn, mistrustful of others, and she indulged in considerable day dreaming, sitting about the house and imagining she took part in great plays. However she graduated with honors from high school at the age of 17 and worked for seven years then in a clerical position.

In 1923 she fell in love with a man to whom however she was never formally engaged. The patient was very secretive about her affair with this man, seemed to be considerably worried and finally one day blurted out suddenly to her family that she believed herself to be pregnant. With this confession she became highly excited and resistive, laughed a great deal, and on April 19, 1923 she was admitted to the Hospital for Mental Diseases at Secaucus, N. J. Here she was noted as being indifferent to the presence of a four months pregnancy. She was paroled in an improved condition on May 20, 1923 and she was considered to have completely recovered shortly after she had been delivered of a stillborn child.

But mental symptoms now returned monthly at the time of her periods and for from five to ten days each month the patient suffered from spells of depression and suspicions that she was being watched and ridiculed by all about her, and plotted against, all of which ideas were made convincing to her by transient auditory hallucinations. She broke out into silly fits of laughter, refused to eat, would wet and soil and would sit about idly, grimacing in a very peculiar fashion and making peculiar gestures. Her moods were very changeable, at times she was happy and silly, then irritable

and angry, especially when attempts were made to talk to her. At these times she talked in a high pitched childish voice with structure of sentences and manner of production exactly like those of a child.

Since her behavior except for these regularly recurring episodes was tractable, it was possible to care for her at home, until July, 1932, when after a menstrual period failed to appear, she became highly disturbed and her commitment to Kings Park State Hospital resulted on July 20, 1932.

She sat rigidly, staring over the examiner's head in a fixed way, and was described as having an unseeing look, as though she were in a trance. Her replies to questions were long in coming and were given in a highly childish treble. She did not know the year. She admitted hallucinations but evasively refused to divulge their content. With sudden noisy outbursts she kicked her feet high into the air and laughed loudly.

Shortly she agreed to write and wrote the following: "In the year of 1922 I was a mother made out of wedlock. Have been a victim of hallucinations due to the above mentioned fact. I am still under the impression that I hear the voice of my lover and it contains sarcasm above everything else. He is the direct cause of every nervous spell I have been a victim of and I fear that I am an idiot made of at last. The voice says to me repeatedly, If I for one moment thought that she loved me as she did, I would never have committed as base a crime. I had but one love affair during my life time. Draw your own conclusions if you will please, doctor. I am still in love with him, but he does not any reciprocation show. I, a confirmed spinster, will remain, even though peculiar in actions am."

On the ward she was restless and voluble, irritable and surly, kept to herself, smiling, laughing, chuckling loudly in a very foolish fashion almost continually, grimacing a great deal, her entire behavior very affected. In a very silly way she stood before a mirror for hours at a time making faces at herself and indulging in manneristic displays. She continued untidy, noisy, restless, odd, constrained, stilted, affected, flippant, very silly and childish, talking in a babyish fashion, hugely enjoying sucking her thumb. Always

when questioned as to illness she replied that she was insane and did not want to recover. Always she gave as reason for her illness her disappointment in love. Though often entirely uncooperative, irrelevant, antagonistic, she was on occasions able to converse for long periods in a very serious trend before reverting to tittering silliness. She wore her dresses short, decorated her hair with ribbons, and took great delight in playing with dolls.

On January 1, 1933 her menses returned. The clinical note a few days later states, "Astounding as this may seem this patient has nevertheless made a sudden dramatic complete recovery from her psychosis." The patient indeed appeared to have become a quiet, serious, normal individual. She was hazy as to much of her behavior during the psychotic period since her commitment but able to give very clearly a progressive story of other details of her life history. She described her laughter as having been a "very silly, childish, kittenish giggle." She said that her foolish behavior must have come from some inner-controlling force which at times she seemed to be attempting to control but could not. She admitted having had ideas of poisoning for which reason she at times refused food, and said that she actually believed at the time that she was being poisoned. The voice was always that of her former lover, calling her by name, wanting her to phone him, begging for forgiveness for his misdeed. She now had full insight into the imaginary nature of this voice although it had seemed very real to her. She said that during her entire upset she felt as though she were intoxicated with alcohol. She was paroled March 12, 1933, diagnosis, dementia præcox, hebephrenic type; condition, recovered.

She was readmitted to Kings Park State Hospital on June 24, 1933, after having become suddenly upset. On her return she spoke in a shrill childish voice, said that she had been teased at home and that she therefore scratched her sister and little nephew. Her behavior took on the same coloring as that of her previous admission. To date she has continued noisy, irritable, antagonistic, surly, untidy, resistive, affected, simple, childish, theatrical, shouting defiantly at all about her. She walks about with a jaunty gait tittering to herself. Again she repeatedly attributes her upset to the pregnancy of 1922. Giggling and simpering she answers the voice

of her seducer, and there are frequent periods when she is in a state of sexual exaltation. She states that she has felt strongly the hostility of her family because of the disgrace she brought upon them and that she can be contented only in the hospital. She has very vivid fantasies but laughs uproariously when questioned about them and will reveal nothing. The bizarre structure of her sentences continues. She is more especially psychotic at the time of her periods. In almost every detail she is again a child.

CASE: I. R. was born in Philadelphia on April 8, 1895, the third child and the only girl of a Hebrew family of 13 children. Her birth and early development were normal. She completed grammar school at the age of 13, remained at home for two years and then for two years worked as saleslady in a five-and-ten-cent store. She was described as intelligent, but seclusive, shy, sensitive and reticent.

At a party 21 years ago a man forcibly attempted to attack her sexually. The patient escaped through a window, arrived home breathless, and laughing and crying hysterically finally made known her narrow escape. She did not seem to recover from this upset. She gave up her few friends, her job, stayed almost entirely within the home and she showed increasing peculiarities and slumping of interest. She sat quietly for hours on end in rigid postures. Questions had to be repeated to her many times before a response was obtainable. Occasionally she would wet and soil her clothing. She would cover the walls and floors with penciled scribbling, or seated on the floor, would play for hours with dolls.

For 21 years her mother has cared for her just as one would for a child.. Ten years ago a marriage was arranged for the patient, the parents believing that this would effect a cure. She gave birth to a child which died within a week, and the husband shortly thereafter left her without regret and without any apparent reaction on the part of the patient, who went along as usual until August, 1935, when she became unmanageable at home. She had uncontrollable attacks of rage and destructiveness, exposed herself openly, resisted the attentions which were necessarily offered her and on October 26, 1935, she was admitted to Kings Park State Hospital. The commitment paper states, "She acts and talks like a child."

In the hospital the patient has been very dull and inaccessible, questions having to be repeated many times. Her expression is generally vacant and stolid, and she is often preoccupied. When asked to do things on the ward she is apparently unable to comprehend. She must be urged repeatedly to complete the process of undressing. She gives her maiden name and denies ever having been married. She does not know where she is, how long she has been here or whence she came. She must be induced to eat, then eats ravenously, her mouth engorged with food. She gives her birthday correctly but insists that she is 23 years old. When told that the date of her birth would make her older she shrugs her shoulders and answers, "No, that's not right, I'm 23." She says she left school three years ago. She says she has a sister named Ida, then admits she has no sister and that Ida is really herself. She reads slowly and mispronounces freely. She believes that the Hudson River and the Mediterranean Sea are oceans, and that Staten Island and Philadelphia are the largest cities in the world. A clinical note reads, "The entire attitude of this patient is very childish, and this lack of maturity is the outstanding feature in her case. Her reaction type appears to be one which one would normally expect to find in a child of three to four years of age."

CASE: P. M. was born in New York City in December, 1904. One brother is suffering from dementia præcox. The patient's prepsychotic makeup is not known; she is said to have been "normal." She graduated from high school at the age of 18. She then fell in love with a young man with whom she had sexual intimacies. The patient's mother, an extremely domineering woman, strongly forbade further association between the couple though the lover was agreeable to marriage. The patient now became a virtual prisoner in her home, a household slave, despised and abused. A psychosis appeared then, apparently sudden in onset, and in a highly disturbed state she was admitted to the Brooklyn State Hospital on November 22, 1923. Here she was described as restless, excited, voluble, commenting freely on things about her, interfering in a playful manner with other patients, and exhibiting affected dramatic conduct, peculiar grimacing and gesticulations. Her excitement then subsided and she appeared stupid and retarded, simple

and childish. She was paroled on June 28, 1924, condition improved and one year later was discharged as recovered.

In reality however, she was not recovered; at home she was seclusive, dependent, impulsive, foolishly extravagant and she retaliated with abusive outbursts when she was remonstrated with. About once monthly, and more or less in association with her menstrual periods, she had episodes when she directed severe tirades against her mother in particular and her home surroundings in general.

She was admitted to Kings Park State Hospital on January 12, 1926, a few days after she had, in a moving picture house, affectionately (and surprisingly to the mother) rubbed her face on the latter's shoulder, and then left her mother to seat herself on the lap of a strange young man whom she embraced while calling him by the name of her former lover. With difficulty she was brought home. Here she did not appear to recognize the members of her family. She became very disturbed and destructive, talked incoherently about a marriage certificate and she kissed the policeman who arrived with the ambulance.

In Kings Park State Hospital where she has continued a patient her entire general attitude and behavior has been that of a little child, as the clinical notes of many physicians will testify. Her expression is generally smiling, though often she seems absorbed and in a dreamlike state. She is mostly inaccessible though friendly and affectionate. She is always trying to embrace someone, always posing in an affected manner, smiling steadily at all about her, waving her hands and throwing kisses in a good natured way. She whispers to herself and chuckles happily, bursts into sentimental song to which she makes up the words as she goes along. She talks in a squeaky, high pitched singing voice, laughing continually, and using baby talk. She has had for the most part to be spoon fed, dressed and undressed. She curtsies to the physicians whom she addresses as "dear." She exposes herself, she plays with her toes and she says that she is only 12 years old. She is disoriented for time and place, calls the hospital a school, believes that she has been here "just a short time" and she freely misidentifies all about her. Often she speaks very childishly of

her love. She asks the physicians if they are related to her. She poses before mirrors and grinning and nodding her head in a bird-like manner, says that she is Jackie Coogan. "She acts," read the notes, "as though she were trying to be young again." She curls up in chairs and goes to sleep. Suddenly she asks if she might go home. She will not obey commands. When interviewed she walks about on tip toes, is easily diverted by objects about her, skips up and down peering closely at the door knobs, dances a few steps, then becomes dreamy and inattentive.

Case: J. W., a young adult negro male was admitted to the Kings Park State Hospital on November 10, 1934. Twelve days previously he had been arrested in Brooklyn by police who, noting him to be in a confused state, took him to Kings County Hospital. He was there described as dull, simple, shallow, confused, superficial in general attitude and behavior, and with loosely systematized delusions of grandeur. The physical examination was negative.

No further anamnestic data has been obtainable and so we are unable in this case to point to any specific psychic trauma which he might have suffered. He is being presented therefore only because though he is believed to be suffering from dementia præcox, hebephrenic type, yet he exhibits quite well the characteristics which we have been discussing.

On admission to Kings Park he said he was a secret service man, that he had been working on the Lindbergh case until just before his commitment when he was shot in the back(laughing uproariously). When told there was no bullet mark he suggested he was shot with a blank. In babyish treble he said that his job was to catch bootleggers. He said he was born in Virginia on November 10, 1912, and that he was 22 years old; a few moments later he gave his birthday as February 10, 1922, his age, 22 years, and then again he had no birthday and his age was 16. Throughout the interview he laughed loudly, grinned and chuckled in a very silly yet hearty childish way. He agreed to everything that was told him, no matter how contradictory. He admitted hearing voices whispering about him but would reveal nothing of hallucinatory content. He called the hospital a police station, Sing Sing, said that he had come

voluntarily, and that he wanted to remain here. He said he had left the fifth grade when 12 years old and that he had come north from Virginia four years previously.

When asked his address, the year, the month, by what means he had come to the hospital, his replies were: "Darned if I know." He read the cowboy story in a childish way, said "Darned if I know the point of that story," and then refused to read further, saying, "Me can't read." For his name he made an illegible scrawl. He gave the date of the Civil War as 1907. He would not cooperate for the more difficult problems, replying with his usual smiling "Darned if I know," but readily stated that 5 and 4 added to 8, 3 and 4 to 10, 5 and 2 to 6, 5 and 2 to 8, 2 and 2 to 3, 6 and 2 to 12, 3 and 4 to 8, and that 12 divided by 6 yielded 4.

To date the patient has continued to exhibit simulated foolishness and a strikingly childish behavior. Almost invariably he makes use of an infantile vocabulary uttering his words with a childish manner and intonation. He shows a childish curiosity of environment. He insists he does not recognize his physician though he has of course seen him many times. He says that his name is James, just James, that he has no name, that he is only 16 years old. To the date or nature of the hospital he replies "Me don't know" or he will readily give the first date that enters his mind. When questioned he often repeats in the following manner, "He said, can you read; he said, can you spell; he said, how old are you," as though he were enjoying a huge joke. He laughs and chuckles gleefully throughout each interview and, singing loudly, he spells thus; cat, r-a-t, dog, g-o-d, mouse, r-a-f, chicken, c-a-t, pen, p-a-t, dog, g-o-g, nose, c-a-t, hat, p-a-t, adding, "Is that right, me right, ain't me," and "Me can't spell fish" although he had not been asked to spell it. At times he will entirely refuse to attempt to spell, saying, "Me used to can spell, me forget," or to count, insisting, "Me can't count, me gets shamed to count." When asked to tell time by the clock he enters wholeheartedly into the spirit of the game and has a grand time. At 2 p. m. he reads the clock to say 10 after 12; at 3:30 p. m. he insists it is a quarter past 6 o'clock; at 6 p. m. it is 12:30, and so on. He denies that he is silly and replies "Me don't joke." He refers to himself also as "that guy," says

that he is very happy and without troubles or illness, and that he believes he is in Virginia, but "I ain't sure of nothing, I don't know."

In the following case the divorcement from reality was not dramatic, the psychosis due to no apparent cause, and insidiously progressive. There can scarcely be any doubt of the correctness of the diagnosis of dementia præcox.

Case: M. P. was born in New York City on April 12, 1897 of English parents. The family history is said to be negative. The patient was a healthy child, but as an adult has suffered irregular menses. She took a teacher's course and at the age of 19 started to teach in a public school. It was noted now that she seemed to be undergoing a change of personality. She became increasingly seclusive and reticent, appeared to lose ambition and interest and she expressed ideas that people were watching her and talking about her. Strong trends against her family developed and she made attempts to escape from her home.

Admitted to the Long Island Home on July 13, 1925, she was there described as being very silly, childish, elated, yet seclusive, indifferent and suspicious. She wet and soiled, removed her clothing, required to be spoon fed, and at times she screamed loudly expressing delusions concerning her heart and stomach. She was transferred to Kings Park State Hospital on October 30, 1925, and has continued a patient here.

She is very noisy and resistive to care and considerable use of restraint has been necessary. She tries to escape through every door, breaks windows when she can, has frequent attacks of rage when she tears off her clothing and runs about naked. Her productions are generally rambling, scattered and irrelevant, and she talks a great deal to herself. She wets and soils and has to be dressed and undressed. She will not eat and spits out the food when she is fed, kicking and striking at all within reach, then will eat voraciously of her own accord, tearing at her food with teeth and fingers as long as she will be allowed. She smears herself with food and saliva. She pulls the hair from her head and attempts to eat it. She will sit on the floor and not on a chair and when approached will kick and scream. She throws chairs about, bites her-

self and slaps others. She talks a stream of irrelevant nonsense, the trend often having to do with little children, and she repeats herself endlessly. She is constantly laughing and giggling in a very silly childish way. She cannot name the hospital or give the year. She says that she is "only four years old" or "only eight years old" and that because she is a little girl she cannot behave herself. But she is very happy, she says, even though she is "insane," and she does not want to go home. She wants to stay where she is and continue to tear magazines, to talk baby talk and to act like a child.

It is believed that the above cases illustrate the absence of a hard and fast distinction between the neuroses and the biogenetic psychoses, and that they corroborate Hoch's teaching of the striking similarity of structure between cases of dementia præcox accessible to analysis and the purpose psychoses. It is interesting in this connection to note that soldiers returned from the front suffering apparently from a severe dementia præcox often made startling recoveries. "While an outside view of dementia præcox (Hoch[8]) reveals an arbitrary array of manifestations: of delusions, hallucinations, queer notions, or authochtonous ideas, an emotional condition often out of harmony with what the patient says, peculiar incoherent utterances which impress one merely as a scattered ideation, bizarre acts often executed with an impulsiveness which appears strikingly forced and elementary—an analysis often shows us that instead of there being a lack of connection or significance in this array of manifestations, all these expressions mean something to the patient, that definite principles of dependence of the individual symptoms upon each other can be made out, that certain mechanisms are at work, and that instead of an arbitrary diffusion there is in these manifestations a certain limitation to definite trends."

It is believed that the underlying constitutional factors (though as yet imperfectly understood) are responsible for the striking variation of reactions to stresses of the same nature. It is seemingly this element of inherent structure along with the unalterable character of distressing situations which in some cases is responsible for a chronicity of course, giving rise to a schizophrenic deterioration rather than a manic-depressive upset or a psychoneurotic episode.

In the biogenetic psychoses, precipitating situations which might be pointed out as having an undoubted psychic correlation to the psychosis are not so frequently to be found. The precipitating situations are seldom in the foreground, and are only too often apparently altogether lacking or assuming the form of occurrences widely experienced. These "hardly-to-be-noticed" occurrences have for the individual, however, a more profound meaning than is apparent on the surface, a meaning which may be elicited by "increased attention to superpersonal or social factors operative in human life" (Sullivan[9]). Only thus may there be brought about an understanding of their connection to the fundamental structure of the biophysical makeup, to the psychobiological difficulties of the individual, whose submerged cravings are thereby brought to the surface.

"We are, therefore, in dementia præcox (Hoch[10]) dealing with undercurrents which, however, as our experience shows, seem to give rise to the same sort of attempts at adjustment as those conflicts which are more on the surface, but they are often less transparent, the conflicts less obvious, partly because the normal person cannot understand the opposing forces of the conflicts and the real desires, partly because they refer to very personal matters, and therefore are under the influence of distorting and repressing forces which make the analysis more difficult. Anyone who has analyzed cases of dementia præcox must have been impressed with the fact that the content often unmistakably refers to disharmonies in the sexual sphere, and this is, as we have reason to believe, not accidental, but due to a fundamental defect of sexual adaptation in its widest sense."

"In the conduct of the schizophrenic," writes Campbell,[11] "the purpose and the value may be obscure but the springs of action can often be seen . . . the behavior of the schizophrenic is incoherent but full of fragmentary meaning."

"On the psychological side, then, (White[12]) dementia præcox is seen to be a certain type of reaction to a mental conflict, resulting in a splitting of the psyche and the outcrop of unconscious mental trends to the surface of the mental life. The patient is confronted with a situation to which he cannot adequately adjust, which is abso-

lutely unacceptable and impossible, and he is therefore driven away by his incapacity to assimilate it and cast back upon himself."

Through a further study of the literature and through his own experience the writer is led to believe with Meyer[13] in the "fundamental importance of the psychogenic material," and that in dementia præcox there is a "tendency to turn on definite complexes, and these especially in spheres which are difficult to reach for an adjustment." The writer believes also that "not only the so-called psychoneuroses or minor psychoses, but also the more unintelligible types dissolve themselves to a far reaching extent into reactions not so foreign to normal human experience,"[14] and that there is "not only a 'method in the madness,' but there are many common links with the normal, where the passing generation vainly sought for exclusive salvation in the urine and faeces, and in the sham comforts of neurologizing tautologies."

And with Meyer[15] he believes further that "we are far from dealing with simple etiological constellations in the mental disorders of the deterioration group," and that "the main contrasts or extremes are the cases with strong constitutional bias requiring but little extraneous cause, and those with at least superficially more normal makeup and a preponderance of overt, more or less extraneous or circumstantial etiological factors. The essential in both extremes and in the intermediary cases is the break of compensation of adjustment with the peculiar attempts at balance and reconstruction which constitute the glaring surface picture of the clinical description and the special mechanisms of the analytical consideration."

BIBLIOGRAPHY

1. Hoch, A.: On some of the mental mechanisms in dementia præcox. Dementia Præcox. Hoch, Meyer and Jelliffe. Richard Badger, Boston, 1911.
2. Pitres, L.: Leçons cliniques sur l'hysterie, 1891, t. ii, p. 219.
3. Dupré, C.: Un syndrome psychopatique particulier: le puerelisme mental. Congrés de Bruxelles, 1903, t. ii, p. 269.
4. Janet, P.: Les Obsessions et la Psychasthenie, 1903, t. i, pp. 391-392.
5. Mott, F. W.: War neuroses and shell shock. London, Oxford University Press, 1919, p. 81.
6. Glueck, B.: Studies in forensic psychiatry, 1916, W. Heinemann, London; and A contribution to the study of psychogenesis in the psychoses. Amer. Jour. Insan., 1912, LXVIII, 368.
7. Jung, C.: Psychology of dementia præcox. N. and M. Dis. Pub. Co., N. Y. Monograph No. 3, 1909, 146.
8. Hoch, A.: See reference 1.

9. Sullivan, H. S.: Research in schizophrenia. Amer. Jour. Psychiat. Vol. IX, Nov., 1929.
10. Hoch, A.: See reference 1, page 2.
11. Campbell, C. M.: On the definition or delimitation of the schizophrenic type of reaction. Schizophrenia Assn. Research N. and M. Dis., N. Y., 1929.
12. Jelliffe and White: Diseases of the nervous system, 5th ed. Lea and Febiger, Phil., 1929.
13. Meyer, A.: What do histories of cases of insanity teach us concerning preventive mental hygiene during the years of school life? The Psychological Clinic, 1908, XI, 89.
14. Meyer A.: The aims and meaning of psychiatric diagnosis. Amer. Jour. Insan., Oct., 1917, p. 163.
15. Meyer, A.: An attempt at analysis of the neurotic constitution. Amer. Jour. of Psychol., Vol. XIV, 1903, pp. 90-103.

REPORT OF THE TREATMENT OF A SEVERE CASE OF PELLAGRA AND ALCOHOLISM WITH RECOVERY*

BY MEYER M. HARRIS, M. D., PERCY P. POLIAK, M. D., AND JOSEPH R. BLALOCK, M. D.

The patient to be presented is a white male, of Scottish descent, age 36, accountant by occupation, who, for several years prior to his hospitalization, had consumed small quantities of cheap gin almost daily. During the last year his drinking increased while his diet became restricted both in quantity and variety. According to his history, he was living almost exclusively on canned soups, tomatoes, oatmeal, and small amounts of dried fish at intervals. Several weeks before his admission to the Psychiatric Institute, the patient presented himself at the Eye Institute of the Columbia Medical Center complaining of blurring of vision. This was his first complaint. Because of certain neurological findings he was soon referred to the Neurological Institute, and after a short stay there he was transferred on April 18, 1935 to the Psychiatric Institute because of the development of mental symptoms.

The patient's family history has no points of significance and is negative for alcoholism and mental disease. His mother died of cancer in 1931. His father is living and well, working as a bookkeeper. One younger brother is at a sanatorium under treatment for intestinal tuberculosis.

The patient's birth, developmental, and early history were uneventful and inconsequential as regards his illness. At the age of 15, however, he states that he had a transient episode lasting about three months, during which time he was "nervous and self-conscious," and had a gait difficulty, with trembling speech. The patient is rather vague in his descriptions of this episode but attributes the disturbance to too much tea drinking. He was drinking, he says, three or four cups of strong tea daily over a period of several months. Soon after he stopped drinking tea, he states, his disturbance cleared up, and he was never bothered in that way again. The patient's father does not recall any such episode. The entire affair

*Case presented before the New York Society for Clinical Psychiatry.

(From the Departments of Internal Medicine and Clinical Psychiatry of the State Psychiatric Institute and Hospital, New York, N. Y.)

is rather obscure and it is difficult to evaluate its significance. At the age of 21, while working as an accountant in a banking firm, the patient married a girl who was not acceptable to his family. Nevertheless, everything went along fairly well until about three and one-half years ago (1932) when the combined factors of economic depression, reduction in salary, and friction with his wife, owing to her alleged infidelity, threw the patient into a mildly despondent state and he took to drink for solace. About two years ago, the patient lost his job because of a general cut-down in the employment roll. Bitter quarrels with his wife followed, and they separated. The patient then went to live with his widowed father and kept house for him. The father made few demands on the patient, simply requesting that he prepare breakfast and suppers and keep the house in order. This the patient did quite faithfully. The father paid little attention to his son, and was not aware of the increasing sparseness of the diet of the latter, who was beginning, because of his chronic alcoholism, to find it increasingly difficult to hold anything on his stomach. He found that about all he could tolerate was soup, dry cereal, toast, and occasionally canned tomatoes and dried fish. The father seemed unaware of this state of affairs. He did not know that the patient was drinking in spite of his warning that the patient had better not be caught around the home in an intoxicated state. He discovered later, however, that the patient had continued to drink gin, outside the home, which he obtained for 40 cents a pint.

Gradually the patient's drinking became more overt, and he was, on several occasions, found intoxicated by his father. Early in March, 1935, following a drinking bout lasting two days, the patient awoke to find that his vision was blurred. He visited an optician who recognized that the trouble was not a refractive one, and referred the patient to the Eye Institute. Here the examination disclosed sluggishly reacting pupils, a flame-shaped retinal hemorrhage in the right eye below the superior and inferior temporal arteries, and a large striate hemorrhage in the left retina at the upper temporal edge of the disc. His eyes otherwise were negative. These hemorrhages were attributed to violent vomiting which, according to the patient, followed his attempts to eat various foods.

It was also noticed that the patient had a marked tremor of the fingers and tongue, and a horizontal nystagmus on looking both to the right and left. The diagnosis given at this time was "alcoholic toxic amblyopia." Two days later, on March 21, 1935, the patient was admitted to the Eye Institute. Forced spinal drainage was done by withdrawing 120 c.c. of spinal fluid and injecting 1800 c.c. of half-normal saline intravenously. The spinal fluid examination was entirely negative. General physical examination was reported as negative aside from the aforementioned tremor. Two days later the patient was discharged. Several weeks later, April 15, he was admitted to the Neurological Institute. In the interval between his discharge from the Eye Institute and admission to the Neurological Institute, the patient continued to drink heavily. At the latter institute he is reported to have exhibited a peculiar emotional apathy with "slowness of cerebration." There was marked horizontal nystagmus, some weakness of the lower branch of the left fifth motor nerve, and diminished hearing on the left. Both corneal reflexes were hyperactive. The deep tendon reflexes were hyperactive in the upper extremities, but considerably diminished in the lower limbs. The cremasteric reflexes were absent and the superficial abdominal reflexes were active bilaterally. Speech was somewhat dysarthric. There were generalized fine and coarse tremors of the limbs and tongue, with incoordination and some ataxia in all four extremities which was more pronounced on the left side. There was hyperesthesia of feet, otherwise the sensory system was negative. The general physical examination was negative aside from the previously mentioned neurological findings. The diagnostic impression was: (1) toxic amblyopia, (2) multiple sclerosis, (3) alcoholic polyneuritis with motor involvement. The patient was seen again by a member of the staff of the Eye Institute who remarked that he had never seen a toxic amblyopia due to alcohol come on so quickly as in this case, disappear so rapidly, and then return again in two or three weeks. He stated that amblyopia from ethyl alcohol was always gradual in onset and disappearance and that from methyl alcohol was sudden in appearance, but was without remissions, such as was observed in this patient. After a few days at the Neurological Institute, the patient developed a state of

acute mental confusion with hallucinations and delusions and was accordingly transferred to the Psychiatric Institute on April 18, 1935.

On admission to this hospital the patient was found to be completely disoriented, markedly confused and in an expansive, genial mood. He demonstrated many bizarre fabrications and confabulations rather typical of a Korsakoff syndrome. He overtly hallucinated, carrying on humorous conversations with imaginary persons about him. He spoke of seeing black cats, brown dogs, of hearing his wife talk to him, and he picked up and pretended to smoke imaginary cigarettes. At intervals he was clear enough to give some information regarding himself. For the first few days he was allowed to be up and about or in bed, as he chose. He was very unsteady on his feet and often lost his way about the ward. His gait was definitely ataxic and there were gross tremors of all extremities. He seemed to be in a state of moderate malnutrition, being 5 feet, 5½ inches tall and weighing only 123 pounds. His speech was slurred and his vision was impaired. The face was flushed, and the eyes had a peculiar glassy stare. The skin on the dorsal surfaces of both hands, wrists, and feet, and on the elbows was reddened and roughened to a slight extent but easily noticeable. These lesions were sharply circumscribed and symmetrical. The tongue was dry but neither red nor sensitive and no stomatitis was present. Neurological findings, which were not previously noted, were: generalized weakness of the muscles of the extremities, particularly the extensors, slight atrophy of the interossei muscles of the hands, and tenderness to deep pressure along the course of the nerves in the legs. The ankle jerks were absent. It was impossible to satisfactorily test the patient's sensory system owing to his mental state; however it appeared that touch was unimpaired; whereas pain, temperature, vibratory and proprioceptive sense seemed somewhat impaired below the knees on both side, but more on the right than the left. Subjectively, the patient complained of numbness, tingling and burning sensations in the hands and feet.

Soon he developed a marked diarrhea, averaging about eight stools per day and which subsequently became almost a continuous

flow of liquid stool. The laboratory findings of extensive blood chemistry determinations, stool examinations, agglutination and other tests, were essentially negative except for a moderate secondary anemia and an absence of free HCl in the gastric contents, with a low total acidity (8.0) (the histamine test has not been done) and a low serumprotein of 4.7 gm. per 100 c.c.

The clinical syndrome of mental disturbance, diarrhea, dermatitis, and the neurological findings, the achlorhydria and the history of chronic alcoholic indulgence with long standing deficient dietary intake, suggested the diagnosis of pellagra. Accordingly, the patient was administered a high vitamin, high caloric diet, augmented by the intramuscular injection of concentrated liver extract* (Lilly)—1 c.c. daily, vitavose (a soluble preparation of wheat germ, rich in vitamin B1), crystalline ascorbic acid (redoxon)—200 mg. daily by mouth, dilute HCl—gtts. x to xxx t. i. d. in acidophilus milk, and bismuth and paregoric for the diarrhea. The patient's appetite was very poor, and his diarrhea persisted. He gradually grew weaker and weaker and finally, in early May, 1935, about three weeks following his admission to the Psychiatric Institute, reached such a critical state that permission for a postmortem examination was requested and granted; but following life-saving measures, including a transfusion of 250 c.c. of blood, hypodermyclosis of saline and glucose and an increase of liver injections to 3 c.c. daily, the patient began to show improvement, which was steadily progressive. After the patient's condition had markedly improved, the concentrated liver extract was reduced to 1 c.c. intramuscularly, daily, and four concentrated yeast tablets (Harris), daily, were substituted. Iron ammonium citrate was administered for the anemia.

Today, seven months later, the patient is still receiving dilute HCl and yeast concentrate tablets (liver extract was discontinued September 11, 1935). He is physically in good condition. He no longer complains of neuritic pains in his legs or of tingling and numbness. The last gastric analysis, on November 27, 1935, still showed an absence of free HCl. The neurological picture is essentially negative except for the persistent absence of his ankle jerks.

*Solution liver extract concentrated: each cubic centimeter contains active material derived from 33 1/3 gm. of fresh whole liver. Larger doses of this material are required for treating pellagra than those used for cases of pernicious anemia.

Mentally, the patient shows only a moderate apathy and lassitude with what might be termed sluggish cerebration or diminished intellectual acuity. Psychotic manifestations are no longer present. The patient has only a partial memory for his period of acute illness.

The diagnosis of pellagra, its status as a specific disease entity, its etiology and its relationship to alcoholism present many interesting points that merit some discussion. It would be beyond the limits of this paper to review the voluminous early literature regarding pellagra. Those interested may refer to the extensive monograph on pellagra by H. F. Harris,[1] published in 1919.

Pellagra is considered by many at present as a nutritional deficiency disease, although other views are still held by some.[2] It is described as being clinically manifested by three usual symptoms: dermatitis, diarrhea and dementia. The exact relation between pellagra and dietary error still requires elucidation. It is possible, and in fact, highly probable, that the various symptoms which the disease presents are not due to the deficiency of the same factor but rather to different factors or combinations of factors. The deficiency may be a result of either the lack of a sufficient amount of certain essential foodstuffs in the diet or to a disturbance in the absorption of these essentials from the gastro-intestinal tract even though administered in sufficient amounts. These considerations, namely, the likelihood that the clinical syndrome of pellagra is due to a multiple deficiency and the possibility that important essentials may remain unavailable to the organism even though administered orally because of a deranged function of the gastro-intestinal tract, are important considerations in treating a patient with pellagra who is critically ill. In the older literature cases of pellagra with night blindness were described. This blindness is known now to be due to a deficiency of vitamin A[3] and is another example indicating the possibility of the presence of multiple deficiencies in the disease. It is pointed out in the "Survey of the Present Knowledge of Vitamins," compiled by a committee appointed by the Lister Institute and British Medical Research Council, published in 1932, that although a considerable number of points regarding our

knowledge of pellagra remain obscure, from the practical point of view, much useful knowledge is available.[2]

Funk[4] was the first to suggest that pellagra, like beri-beri, might be a deficiency disease. Voegtlin and his coworkers[5] administered to pellagrins a 95 per cent alcoholic extract of ox liver in daily doses equal to 1 kg. of fresh liver. They claimed that the extract which was almost free from amino-nitrogen produced as good a therapeutic effect as a diet containing a considerable quantity of milk, eggs and meat.

Goldberger[6] among others was of the opinion at first that an amino acid deficiency was the cause of pellagra and he and his coworkers confirmed the value of milk and meat in both the prevention and treatment of this malady. In fact most of the earlier pellagrologists had recognized the value of proper food in the treatment. However, Goldberger observed that the liberal addition to the diet of caseinogen, previously purified by repeated washings in acidulated water had no effect in preventing the systemic lesions of pellagra, although it appeared to have some power to avert the appearance of the characteristic dermatitis. This finding was important since it showed that one of the symptoms of the disease could be cured while others persisted. This pointed to the possibility, at the time, that different factors might be responsible for the different symptoms. It also showed that animal protein of high biological value, such as casein, was not the all-determining factor. Furthermore, Goldberger and his coworkers[7] had observed that yeast was effective in treating experimental black tongue in dogs, a condition which was thought to be analogous to pellagra. They therefore tried the effect of yeast as a prophylactic against pellagra in the human. It was found that 30 gms. daily of dried brewer's yeast gave complete protection and 50 gms. of the dried yeast powder was effective in patients with severe symptoms.

Later, Goldberger and his coworkers[8] tried a commercial preparation made from an acidulated watery extract of yeast and which contained little protein-nitrogen. This was equally effective, given in doses of 15 gm. daily. This dose was purely arbitrary and Goldberger points out that smaller amounts might have been effective.

A non-protein P-P (pellagra preventive) factor was therefore postulated in yeast and other foods with similar properties.

As a result of subsequent work on rats, Goldberger and his coworkers were able to show that the P-P factor present in the yeast vitamin complex differed from the antineuritic vitamin, now called vitamin B1 or, more recently, aneurine (in the stability of the former toward heat as compared to the latter). This more heat-stable complex, which they call the P-P factor, was later known as vitamin B2 or G factor.

Vitamin B1[9] has recently been obtained in crystalline form and has also been prepared synthetically, while the so-called heat-stable vitamin B2 complex has been shown to be composed of several factors. One of these factors has now been identified chemically as a flavine,[10] and it has been suggested by Kuhn that the lactoflavine which he obtained from the vitamin B2 complex of milk be called vitamin B2. This flavine will cure the symptoms of sticky eyelids (described by Goldberger in his vitamin deficient rats) according to Jansen[11] but will not prevent pellagra[12] nor permit normal growth in chicks on a low ration of the vitamin B2 complex, to which lactoflavine is added according to Elvehjem.[13] It should be pointed out that vitamin B1 is totally unrelated to vitamin B2 (flavine)[14] chemically and it is likely that the remainder of the vitamin B2 complex will contain one or more substances which are unrelated to the flavines. Although one or more important substances besides the flavines are undoubtedly present in the original vitamin B2 complex and they have been labelled B3, B4, B5, B6, etc.,[15] their identity is based on rather unsatisfactory experimental evidence and the existence of some of them is questioned. The problem awaits further chemical elucidation. Until we know more about the rôle of the individual substances in the symptomatology of the complex picture of pellagra, it is desirable to treat pellagra in the human with sources of the vitamin B2 complex or food essentials which experience has shown to be effective therapeutically. Thus Spies[16] indicates that some yeast and liver preparations are better than others. Mullholland[17] thinks that liver may be more effective

than yeast. Essential factors important in the treatment of pellagra may be present in these complex substances regarding the identity of which we know nothing. It is known that the flavines do not influence the dermatitis in the experimental animals nor in pellagrins.

Spies[16] has pointed out the importance of choosing liver or yeast preparations of tested potency. The liver extracts for parenteral use on the market are tested for the pernicious anemia factor. However, this may not be and probably is not the same factor which is essential for treating pellagra. It was found by Brand, West and Stucky[18] that samples of liver extract on the market from different manufacturers, although equally potent in pernicious anemia, varied markedly in the content of the vitamin B2 complex as tested in rats. We have, therefore, used the (Lilly) preparation which was reported to have a higher vitamin B content than some of the other preparations.

The Rôle of Alcohol and Achlorhydria:

In 1787, John Coakley Lettsom first described "alcoholic polyneuritis" and since that time this condition has been regarded generally as the result of a direct neurotoxic affect of the alcohol. In 1928, Shattuck[19] suggested the possibility that a deficiency of vitamin B might be the cause of polyneuritis in ill-nourished people from various causes including alcoholism.

In 1928, Klauder and Winkelman[20] reported on 100 cases of pellagra, most of which were alcoholic. In this report they point out that the factor of alcoholism is mentioned in all extensive reports in the enormous literature on pellagra and give references to the literature. The authors believe that alcoholic individuals are more susceptible to pellagra following an inadequate diet. Although Spies and DeWolf[21] have shown that the skin and mouth lesions in pellagra will improve even if appreciable amounts of alcohol are ingested provided the patient will, at the same time, consume an adequate diet, this does not necessarily prove that alcohol plays *no* rôle in the presence of a food deficiency.

Minot, Strauss and Cobb[22] found in their investigation consisting of 57 observed cases and 73 other cases reviewed from their records that achlorhydria was present in 50 per cent and low acidity was present in 33 per cent of their cases. This, they pointed out, was in marked contrast to the statistical report of Bloomfield and Polland indicating that only 12 per cent of anacidity occurred in the corresponding age groups. They also call attention to the report of Merrit and Moore[23] who found only one case of achlorhydria in eight cases of alcoholism. Minot and his coworkers therefore suggest that the alcoholics with achlorhydria may be the ones who are more susceptible to pellagra because of this disturbance in the gastro-intestinal tract which may affect digestion and absorption. The high percentage of cases of achlorhydria in pellagra is reported by other investigators.

Minot[22] has also suggested that since, according to Cowgill, the vitamin B requirement is increased with the total calories metabolized, the large increase in the caloric intake resulting from the ingestion of a quart of whiskey (2800 calories) might produce an unusual demand for vitamin B.

Jolliffe and Joffe[24] have calculated the probable caloric intake and vitamin B intake from the dietary history obtained from their alcoholic patients. They find that the cases with polyneuritic symptoms show an inadequate intake of vitamin B in relation to the calories ingested as calculated by the formula given by Cowgill. The reliability of such data is, of course, open to question. Furthermore, it is not known how much alcohol is actually metabolized and how much is lost.* Spies thinks that the alcoholic patients develop pellagra merely because they substitute drink for food.

Several factors may therefore be at work in bringing about the dietary deficiency in the alcoholic individual as follows: primary or secondary disturbances in the gastro-intestinal tract, increased needs for vitamin B resulting from the ingestion of large amounts of alcohol, and loss of appetite and gastro-intestinal upset resulting

*According to Newman and Cutting (30), the maximum rate of metabolism of alcohol is fixed and is independent of the level of alcohol in the blood. This, he found, is about 0.17 c.c. of alcohol per kg. per hour in the human. A man weighing 60 kg. would therefore metabolize a maximum of $0.17 \times 60 \times 24 = 245$ c.c. (approximately) per 24 hours.

from the vitamin deficiency which aggravates the condition by further cutting down the ingestion and absorption of a proper diet already reduced by the substitution of proper food by drink.

It is of interest that our patient was found to have an achlorhydria during the period of his illness, which has persisted even during the period of marked clinical improvement. Mullholland found that achlorhydria may be temporary or permanent and that cord lesions were a little more common in cases with achlorhydria. Cowgill and Gillman,[25] in their study of the "Effects of lack of vitamin complex on secretion of gastric juice in dogs with gastric pouches," found a decreased secretion which was due to a lack of vitamin B1. Administration of this factor restored the gastric secretory response to normal. When a Goldberger vitamin B2 deficient diet was given plus vitamin B1, the gastric secretion was not affected. They also found that severe nervous symptoms in the animals could not be correlated with the disturbance in gastric secretion. These findings are of interest for they may indicate that the temporary achlorhydria in cases of pellagra may be due to vitamin B1 deficiency, while the disturbance in the central nervous system may result from lack of one or more factors present in the vitamin B2 complex.

Neuropathology:

A brief word as to the neuropathology of pellagra. Investigations from various sources have shown that certain changes in the nervous system in human pellagra are fairly common at autopsy.[26] There is a so-called central neuritis. The giant cells of Betz of the cerebral cortex show displacement of the nuclei of the cells toward their periphery. There is, at times, involvement of the cells of the anterior horns and Clark's columns of the spinal cord. Most frequent, however, are degenerative changes in the fiber tracts of the spinal cord, particularly in the posterior columns. The degenerative process here is essentially one of demyelinization, with some gliosis in advanced cases. Wherever peripheral nerves are involved, they also show a degeneration of the myelin sheaths and Reich granules in the sheath of Schwann. It is interesting to note

that Grinker and Kandel,[27] experimenting with rats, found no degenerative changes of the nerve fibers in the central nervous system after longstanding severe vitamin A, B1, B2 and B complex deficiency. The effect on the ganglion cells of the central nervous system if very chronic, they believe, may produce secondary involvement of nerve fibers. Zimmerman and Burack[28] attributed these negative results to the fact that rats are able to store vitamin B to such a great degree that it is almost impossible to deplete them. Dogs, on the other hand, readily show central nervous system changes similar to those found in man. Gildea, Castle and Cobb[29] and earlier investigators stress the fact that so many diverse results have been obtained in animal experimentation by various investigators because of the different animal species used. Different species vary greatly in their capacity to live on deficient diets, and besides , there are differences in individual animals of the same species.

Treatment:

In planning the course of treatment, particularly in the very severe cases, we have felt it important to assure an adequate intake of other food essentials even though the symptoms due to their deficiency are not manifest, and to adjust medical treatment to the special indications which may present themselves in the particular case. Thus, in our particular case, besides concentrated liver extract parenterally, vitavose, containing vitamin B1, crystalline ascorbic or cevitamic acid and HCl were added in addition to a satisfactory diet of milk, eggs, puréed fresh vegetables, butter, orange juice, and so forth. In spite of such treatment and marked improvement in the general condition, we noted a considerable lag in recovery from the secondary anemia even though the low blood proteins had returned to normal. It required large doses of iron ammonium citrate, 9 gms. daily, to bring about a rise in the hemoglobin.

Regarding the control of the diarrhea, we have found, as have other investigators, that the usual measures used to control diarrhea are ineffective until the nutritional deficiency is effectively treated.

Laboratory Data:

BLOOD CHEMISTRY†

	Whole Blood				Heparinized Plasma					
Date 1935	Blood sugar	Urea nitrogen	Uric acid	Serum protein	Cholesterol	Sodium	Potassium	Calcium	Inorg. phosphorus	Magnesium
4/19	91	9.0	1.8	..	..	..	..	..	..	
4/29	87	8.5	2.2	4.7	155	307	20.5	9.3	5.1	2.19
6/5	90	17.2	3.0	7.5	223	303	21.5	..	4.2*	
7/30	97	..				314	19.4	..	5.0	

†All figures are reported as milligrams per 100 c.c. of blood, plasma or serum.

*Serum used for this phosphorus determination.

The following methods as given in Peters and Van Slyke[31] were used: Blood Sugar=Folin-Wu, Urea N=Urease method of Van Slyke and Cullen, Serum Protein=Greenberg, Sodium=Butler-Tuthill, Potassium=Breh-Gaebler, Calcium=Clark-Collip and Inorganic Phosphorus=Fiske-Subbarow. For the methods for uric acid, cholesterol, and magnesium see references 33, 34 and 35.

GASTRIC ANALYSES

Date 1935	Time	Free HCl	Total acidity
4/29	Fasting	0	10.0
	1 hour	0	9.0
	3 hours	0	2.0
6/13	Fasting	0	8.0
	½ hour	0	18.0
	1 hour	0	10.0
	1½ hours	0	10.0
	2 hours	lost	lost
11/27	1 hour	0	8.6

(Tea and toast used for test meal.)

BLOOD COUNTS

Date 1935	R. B. C.	Hb (Sahli) Per cent	Color index	Total W. B. C.	Polys. Per cent	Lymph. Per cent	Large monor and transitionals Per cent	Eosinoph. Per cent	Basoph. Per cent	Remarks
4/24	3600000	72	1.0	9900	60	35	4	1	..	
5/2	3400000	62	.91	16200	62	31	7	..	..	1 c.c. liver, etc. started
5/7	3210000	60	.93	9500	63	35	4	1	..	Liver extract increase to 3 c.c.
5/10	3200000	64	1.0	16000	73	24	2	1	..	Blood transfusion. 5/7.
5/28	3390000	64	.93	10800	62	34	2	2	..	Iron ammonium citrate 1 gm.
6/11	3600000	69	.96	15000	60	33	2	4	..	t. i. d. 5/31/35.
6/17	3700000	63	.98	23600	60	38	2	..	..	Fe ammonium citrate 2 gm. t. i. d.
6/26	3500000	66	.94	15000	59	30	7	3	1	6/18/35.
7/2	4000000	70	.88	....	..	..	..	..	..	
7/10	3960000	73	.92	13500	55	40	1	5	..	Iron ammonium citrate 3 gm. t. i. d. 6/27/35.
7/24	4400000	77	.88	17900	51	45	2	2	..	
7/31	4480000	84	.93	12800	54	40	3	3	..	Liver extract reduced to 1 c.c. Harris yeast conc. tablet 2 t. i. d. substituted. 7/2.

SUMMARY AND CONCLUSIONS

1. A case of pellagra with psychosis in an alcoholic patient is reported.

2. The administration of a high vitamin diet was insufficient to control the progress of the illness.

3. One c.c. doses of concentrated liver extract (Lilly), intramuscularly, daily, plus vitavose plus an adequate diet was insufficient to control the disease.

4. Increased doses of liver extract to 3 c.c. intramuscularly, daily, aided by a small transfusion, was a life-saving measure.

5. There has been a marked improvement in the mental and physical states of the patient under continued treatment.

6. The mental recovery lagged far behind the physical improvement.

7. Secondary anemia persisted in spite of the marked improvement of the patient until large doses of iron were administered.

8. Various phases of the pathology and physiology of the disease are discussed and their bearing on the treatment is indicated.

BIBLIOGRAPHY

1. Harris, H. F.: Pellagra. Macmillan and Company, 1919.
2. British Medical Research Council. Vitamins: A Survey of Present Knowledge. Chapter VII, 176 (1932).
3. Harris, L. J.: Vitamins. Ann. Rev. Biochem. 4, 360 (1935).
4. Funk, C.: Die Vitamine. P. 111, J. F. Bergmann, Wiesbaden, 1914.
5. Voegtlin, C., Neill, M. H., and Hunter A.: The influence of vitamines on the course of pellagra. Bull. U. S. Hyg. Lab. No. 116 (1920.)
6. Goldberger, J.: The relation of diet to pellagra. J. Amer. Med. Assn. 78, 1676 (1922).
7. Goldberger, J., and Tanner, W. F.: A study of the pellagra-preventative action of dried beans, casein died milk and brewer's yeast, with a consideration of the essential preventative factors involved. Publ. Hlth. Rep. Wash. 40, 54 (1925).
8. Goldberg, J., Wheeler, G. A., Lille, R. D., and Rogers, L. M.: A further study of butter, fresh beef and yeast as pellagra preventatives. With a consideration of factor P.-P. of pellagra and (black tongue of dogs) to vitamin B. Publ. Hlth. Rep. Wash. 41, 297 (1926).
9. Williams, R. R.: Structure of vitamin B. J. Amer. Chem. Soc. 57, 229 (1935).
10. Hermann, R.: Die Flavine. Hdb. d. Biochem. d. Menschen u. Tiere. Erganzungwerk Bd. III, p. 790. Gustave Fisher, Jena, 1936.
11. Jansen, B. C. P.: Identity of vitamin B2 and flavine and the nomenclature of vitamins. Nature, 135, 267 (1935).
12. Birch, T. W., György, P., and Harris, L. J.: The vitamin B2 complex. Differentiation of the antiblack-tongue and the "P.-P." factors from lactoflavin and vitamin B6 (so-called "rat pellagra" factor). Bioch.J. 29, 2830 (1935).
13. Elvehjem, C. A., and Koehn, C. J.: Non-identity of vitamin B2 and flavines. Nature 134, 1007 (1934).
14. Harris, L. J.: Vitamins. Ann. Rev. Bioch. 4, 338 (1935).
15. Maass, Th. A.: Der B-Komplex. Hdb. d. Biochem. d. Menschen u. Tiere. Ervanzungwerk Bd. III, 885. Gustave Fischer, Jena, 1936.
16. Spies, T. D.: The treatment of pellagra. J. Amer. Med. Assn. 104, 1377 (1935). Ibid. 105, 1028 (1935).
17. Mullholland, H. B., and King, R. L.: Pellagra. A review of cases with special reference to gastric secretion. J. Amer. Med. Assn. 101, 576 (1933) (see discussion).
18. Brand, E., West, R., and Stucky, C. J.: Vitamin G potency of purified liver preparations. Proc. Exp. Biol. & Med. 30, 1382 (1933).
19. Shattuck, G. C.: Relation of beri-beri to polyneuritis from other causes. Am. J. Trop. Med. 8, 539 (1928).
20. Klauder, J. V., and Winkelman, N. W.: Pellagra among chronic alcoholic addicts. J. Amer. Med. Assn. 90, 364 (1928).
21. Spies, T. D., and DeWolf, H. F.: Observation on the relationship of severe alcoholism to pellagra. Am. J. Med. Sci. 186, 521 (1933).
22. Minot, G. R., Strauss, M. B., and Cobb, S.: "Alcoholic" polyneuritis. Dietary deficiency as a factor in its production. New Eng. J. Med. 208, 1244 (1933).

23. Merrit, H. H., and Moore M.: Peripheral neuritis associated with ginger extract ingestion. New Eng. J. Med. 203, 4 (1930).

24. Jolliffe, N., and Joffe Ph. M.: Relation of vitamin B (B1) intake to neurological changes in the alcoholic addict. Proc. Soc. Exp. Biol. & Med. 322, 1161 (1934-5).

25. Cowgill, G. R., and Gillman, A.: Effect of lack of vitamin complex on secretion of gastric juice in dogs with gastric pouches. Arch. Int. Med. 53, 58 (1934).

26. Wilson, S. A.: The pathology of pellagra. Proc. Roy. Soc. Med. Lond. Neurol. Sect. 7, 31 (1914).

27. Grinker, R. R., and Kandel, E.: Experimental vitamin (A, B1, B2 and B complex) deficiency. Histological changes in the central nervous system. Arch. Neurol. & Psychiat. 30, 1287 (1933).

28. Zimmerman, H. M., and Burack, E.: Lesions of the nervous system resulting from deficiency of vitamin B complex. Arch. Pathol. 13, 207 (1932).

29. Gildea, L., Castle, Wm. B., Cobb, S., and Gildea, E. F.: Neuropathology of experimental vitamin deficiency. Amer. J. Path. 11, 669 (1935).

30. Newman, H. W., and Cutting, W. C.: Alcohol injected intravenously. Rate of disappearance from blood stream in man. J. Pharm. & Exp. Therap. 54, 371 (1935).

31. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, 2, Williams and Wilkins Co., Baltimore, 1932.

32. Brown, H.: The determination of uric acid in blood. J. Biol. Chem. 68, 123 (1926).

33. Sackett, G. E.: Modification of Bloor's method for the determination of cholesterol in whole blood or blood serum. J. Biol. Chem. 64, 203 (1925).

34. Watchorn, E.: Serum magnesium in relation to menstruation, with note on calcium. Brit. J. Exp. Path. 7, 120 (1926).

TREATMENT OF PREPSYCHOTIC PERSONALITIES OF THE SCHIZOID AND CYCLOID TYPES

BY A. J. GOSLINE, M. D.,
SENIOR ASSISTANT PHYSICIAN, UTICA STATE HOSPITAL, UTICA, N. Y.

Since time immemorial striving humanity has endeavored to conquer the evils of mankind. The "Kingdom of Evils"[1] concerned with mental illness and liabilities, although realized for centuries, although described and labeled, is still a more or less virginal field as far as therapy and failure-proof prophylaxis is concerned. We are still far from being successful "mental healers"[2] although the twentieth century has thrown a welcome and much-needed light into the dark recesses of psychopathology.

Psychoanalysis with its genetic revelation of symptom formation, has enabled us to better understand human psychology and personality evolution. The therapeutic advances in transference and narcissistic neuroses, the realization of biogenic possibilities together with environmental and psychosexual factors in "functional" mental pathology are hailed as gratifying and promising.

The quarter century of "mental hygiene," a movement with the outspoken vision of promoting good mental health, especially stressed the preventive side of mental medicine. The question "Why do certain persons develop a neurosis or a psychosis and why do others, faced by similar environmental liabilities, maintain their psychic equilibrium?" has always interested the thinking individual. This leads to the question, "Which persons are likely to break mentally, or what constitutes a prepsychotic personality?"

Several categories of prepsychotic personalities have been described by different authors. But there is still ample occasion for further study. A narrow classification cannot solve the question. The prepsychotic personality is above all an individual with specific aims and variations. We can only follow some directing lines.

The state hospital population, apart from organically conditioned alienations, consists mainly of men and women suffering from "narcissistic neuroses." The state hospital physician who is in daily contact with schizophrenic and manic-depressive patients will be especially interested in the genesis of their psychoses and

in the character of the personality which could or was bound to develop a psychosis.

Considering Jung's extravert and introvert types[4] as well as Kretschmer's[5] classification and those of other investigators, I decided to use the terms schizoid and cycloid personalities, which does not necessarily signify that they are prepsychotic. Kretschmer suggests that one designate a prepsychotic schizoid personality as schizophrenic and a cycloid prepsychotic personality as cyclothymic.

Hoch states that about 60 per cent of individuals developing dementia præcox have shown the schizoid type of personality prior to their psychosis. I do not intend to draw analogies between the "constitutional" data and "functional" factors of schizophrenia. I admit that organic structure and physiological functioning in relation to the psychosis is an interesting field of special study. I plan to lay stress in this paper on the developmental factors and the personality structure from a psychological viewpoint, not forgetting, of course, that the human being is a complex biological, sociological and psychological aggregate.

In schizophrenia we find a narcissistic regression, psychoanalytically speaking, a regression more malign than in the transference neuroses and extending back to the level at which there has not been established true object relationships. Dementia præcox also signifies a "return to the early stages of ego undifferentiation,"[3] of beginning differentiation and to "prelogic,"[3] or symbolic thinking.

It is quite evident that in a psychosis of the schizoid type there exists disharmony between the inner and outer worlds and a disorganization of personality or ego functioning. The regressed ego is not able to treat reality adequately. The schizophrenic's interest is withdrawn from the world of reality and his libido cathexis is directed toward himself. Since ego impoverishment and dysfunction of reality testing with narcissistic libido regression are characteristic of schizophrenic psychoses, it seems logical to assume that character traits of the so-called "shut-in" type, the self-centered individuals, the introverts, are in danger of exaggerating the inherent tendencies under environmental or emotional pressure.

The schizoid individual is usually described as the quiet, seclu-

sive and asocial person, who cannot make and maintain healthy environmental and social contacts. He is narcissistic, lacks libidinal growth into heterosexual maturity, is often family-centered with a striking overemphasis on the pitfalls of the family romance, the Oedipus complex. Some types of personalities, it seems, are in danger of developing psychotic symptoms under certain traumatic constellations, as both the quality of the individual as well as his experiences plus their interrelationships will determine the reaction type to life. Marked feelings of insecurity, seclusiveness, exaggerated character traits, such as overscrupulousness, ruminations over religious and ethical problems with special emphasis on the sex life, depersonalization episodes, daydreaming and other retreats from reality, are unsound and threaten the mental equilibrium of the individual.

It has been observed that the hypersensitive asthenic, who habitually concentrates his attention on his body, thus handicaps the body's organic functioning which, it seems, can work effectively only when not under constant conscious control, as the naïve attitude with regard to body functions is lost with too intense self-observation. This lack of naïveté is often found in schizoid individuals.

The name schizoid itself signifies a division, or a cleavage in the mental functions.[6] I would prefer to look at the schizoid individual as possessed of an ineffective, poorly-integrated, self-centered personality which is in poor emotional and social touch with the world of persons and things, but usually in better harmony with the world of knowledge, science, ideas and speculations. There is also often noticed a lack of the humane element in the goal of life.

Before approaching the therapy of schizophrenic tendencies, the second large group of narcissistic neuroses, the manic-depressive psychoses, shall be viewed with the aim of elucidating the underlying personality types which may be a causative factor in the development of the mental illness. It shall not be forgotten, however, that in the cyclothymic type of mental alienation constitutional and hereditary factors may, perhaps, have an even more pronounced bearing with regard to etiology than in the schizophrenic group.

The outstanding phenomenon of marked mood swings, characteristic of manic-depressive psychoses, has been studied psychoanalytically. Studies of depressions have shown that the ego of the depressed patient is conflict with its suger-ego. Ambivalency and pregenital fixations smooth the path for regression. The manic phase seems to release tension, solving a conflict through fusion of super ego with the ego. The manic demonstrates his extreme self-love which is also flavored by ambivalency. The periodicity of the cyclothymic reactions has been thought of as a biological necessity due to very intense surcharge of ego and super-ego in conflict.

The cyclothymic or cycloid personality developing manic-depressive episodes is perhaps not so strikingly characteristic as the schizoid character type. But we may expect in the prepsychotic period also marked mood swings. Some individuals show preponderance of cyclothymic tendencies. They may be hyperactive, their activities multiple, but not well sustained. Their contacts with persons manifest narcissistically oriented libido. The young hypomanic individual shows social lability, he changes environment, position and is uneasy when left to himself. He needs externality to get away from his own impulsive self. There is usually optimism present but he may swing over to depression.

There are also cycloid persons whose predominant reaction pattern is depressive. They are moody, irritable, fault-finding. They may also show paranoid tendencies. Some cycloid individuals show marked affect fluctuations from depression to elation as an outstanding characteristic.

In general it may be said that they are more or less "big children," rather immature and dependent emotionally. They are usually considered frank and open personalities but show poor ability in adjusting to certain conditions of life, especially when love life, or the loss of a love object, or any other narcissistic stress faces them.

The above statements regarding narcissistic neuroses and prepsychotic personalities are meant to be an orientating foundation to the discussion of "treatment of prepsychotic personalities of the schizoid and cycloid types."

The aim of any psychiatric therapy should be towards the best possible mental health. With this aim in mind we will also realize that "normality" and mental health are not something handed over to us as our due share and natural heritage, they are not static but rather very much dynamic, not a dole but a definite accomplishment achieved successfully with effort, with overcoming of obstacles and conflicts.

The title of this paper seems to be rather daring if it should really attempt to dive into the rather unfathomed well of character analysis and reconstruction. This field of psychoanalysis is still in its early infancy.

But I may try to search for therapeutic results attained with mild or incipient cases of schizophrenia with which to begin. Leland E. Hinsie in his comprehensive study "Treatment of Schizophrenia"[7] has offered many valuable hints for our dealings with schizoid individuals. A definite line of demarcation between a schizoid personality and a schizophrenic cannot be drawn anyway. Dr. Hinsie presents early schizophrenics, young individuals, and outlines treatment procedures. He calls attention to the early personality reaction, namely introversion. He selects patients in their adolescent period, individuals who were freely communicative and applied for treatment on their own accord. He prefers to treat them in an environment natural to them, not in an institution, or, if removed from their home, preferably in a general hospital and not in a mental hospital. Early manifestations such as withdrawal from reality, emotional alterations and delusions of reference are indicators of the selection and treatment. The treatment period is at least one year, a modified psychoanalysis plus psychosynthesis and re-eduation were used with rather gratifying results.

In a paper published in the American Journal of Psychiatry for November, 1933, Dr. Hinsie stresses "Determinants of Adequate Psychotherapy."[8] Psychotherapy is adequate and successful in the adult when through analysis, suggestion, and re-education the clinical symptom is removed. In the attempts at cure, the patient's latent assets need investigation and widening. His narcissistic libido needs redirection and partial absorption through gratifying work activities. New objects for the instinctive tendencies should become

available with the aim of transforming subject libido into object libido through socialized activities.

It seems to me that early schizophrenics can very well be treated and benefited through office visits, clinics and if necessary in a general hospital.

The education of the general public along mental hygiene lines will probably result in the recognition of early cases of schizophrenia and in the seeking of medical advice early in the disease process. It should be understood, of course, that the physician selected is well capable to understand the individual and his illness and is able to practice proper therapeutics. The demand for more extensive and far-reaching treatment possibilities and facilities will come with increasing knowledge of the profession and the laity.

Teachers, educators, parents and others will eventually awaken to the fact that the schizoid type of child and adolescent is in greater danger with respect to his mental health than the unruly child who is usually considered the behavior problem by the average person. This leads me to the matter of prophylaxis in childhood, the child guidance movement and parent education.

Sanger Brown, II, and H. W. Potter[9] have published a psychiatric study of problem children. Some of these children are probably candidates for a psychosis in later life and may be regarded as prepsychotic personalities. We consider especially "behavior which is chiefly detrimental to the child's own personality."

Dr. Brown and Dr. Potter outline treatment of behavior disorders in children under the following headings:

1. Removal of the cause.
2. Education of elders (child guidance).
3. Proper understanding through school.
4. Understanding and guidance through the family physician.
5. Psychiatric care and treatment.
6. Social treatment.
7. Institutional care.
8. Habit training in early childhood.

With regard to the understanding of the child in a child guidance clinic we keep in mind the fundamental principles of growth and evolution as well as the observation that the intensity of affects in

the child stands often in paradoxical relation to their duration. The pediatrician, if he is psychologically oriented, is often enabled to witness pathological symptoms *in statu nascendi* and should be the one able to handle them successfully.

Treatment in youth is promising because the child is suggestible and trainable. The environmental factors also make for a favorable or detrimental constellation. A change of milieu will often direct the emotional current into sounder channels. The removal of the symptom may be called a cure in many cases, although we must not forget that the symptom should be evaluated as a reaction of the total personality and treated accordingly.

Anna Freud[10] as well as Freud[11, 12] himself, are rather selective in treating children psychoanalytically. They do not recommend psychoanalysis for every child who needs mental treatment but they keep psychoanalysis in mind as a diagnostic adjunct.

Treatment for the child consists chiefly in education and reeducation. The child should be assisted in finding his special way of adjustment to milieu and life.

Kurt Boenheim[13] stresses change of attitude, treatment of the environment, therapy including the mother and changes of milieu in his dealings with children.

All child guidance experts stress the importance of the child's reactions to play, companions, and school as diagnostically and therapeutically important. The task of the future is the recognition of the importance of infancy and early childhood. The earlier the treatment the better the outlook for a permanent influence. The treatment of the prepsychotic personality in the final analysis means prevention of faulty emotional evolution and prophylaxis of unsound character traits. The shy, seclusive type of individual must be given opportunity and encouragement towards social-mindedness in order to modify his introversion into acceptable and sounder reaction patterns.

The cyclothymic personality types may be looked for among the so-called nervous children. They need understanding, adequate environment, and modification of their narcissistic libido. That child guidance is almost synonymous with parent guidance and education is an oft-repeated truth and important for therapy.

Heredity and constitution well considered, there is still the powerful milieu of persons, and especially of parents who make or break the child. The successful solving of the Oedipus situation[14] is the crux of the adjustment of the introvert as well as the extravert. Wholesome parents who have freed themselves of infantile emotional atavisms will be able to allow the child to grow up to emotional adequacy and maturity.

The child guidance clinics and the mental hygiene movement are still too young to draw any definite conclusions concerning successful avoidance of faulty personality evolution.

The statements made with regard to treatment of schizophrenia via the prepsychotic personality and the difficult child can be in part applied also to the cyclothymic reaction types especially in their preventive and mental hygiene aspects. Recognition of early symptoms, application of adequate treatment in private practice, clinic, home and hospital may become a hopeful procedure in preventing the development of frank episodes of manic-depressive psychosis. Incipient cases should have expert assistance. The trend towards prophylaxis should also be the keynote in the private physician's practice.

A. A. Brill[15] calls special attention to exaggerated emotional states in early life. He made an interesting study of psychotic children following them into adult life. Dr. Brill[16] states that the recognition and treatment of abnormal emotional reactions in early life may create "a sort of immunity for subsequent schizoid or syntonic disturbances." If these children are not helped they may break at puberty. In his treatment procedures he aimed at integrating and stabilizing exaggerated schizoid and cyclothymic factors; he too, is of the conviction that "the ideal prevention must start with the parents."

The cyclothymic child is often the restless youngster who may be a behavior problem. Masturbation and delinquencies may be in evidence. The wearisome child, who shows childhood depressions and somatic complaints, the child who exhibits moodiness and stubbornness, is often classed in the cycloid group. In treating the cyclothymic individual we may emphasize the fact that the ego instinct must be socialized by training and education.

S. E. Jelliffe[17] stresses the variations in emotional tone in the cyclothymic adult. The milder forms of manic-depressive reactions are often not recognized. Such patients may come to the general practitioner's office with physical complaints.

L. E. Hinsie and S. E. Katz[18] in their survey of literature concerning treatment of the manic-depressive psychoses give an excellent review of the theraeputic approaches to cyclothymic symptoms. They accent prophylaxis and cite as means to this end:

1. Modern psychiatric hospitals.
2. Creation of wholesome psychiatric attitude with regard to legal aspects of mentally sick patients (referring and giving credit to W. A. White).
3. Teaching in medical schools.
4. Treatment of incipient cases by private physicians (this is on the ascent).

Dr. Hinsie and Dr. Katz refer to Waelder concerning psychoanalytical approach. Waelder[19] states: "While we cannot exercise control directly over narcissistic fixations, there is some part of the personality still healthy, which may be worked upon." They also mention Campbell's[18] statement to the effect that "one should attempt to reconstruct the entire situation out of which the attack occurred." The conflict and the personality must be understood. The therapeutic adjuncts of a hospital, especially psychiatric nursing and social service, are given their due consideration and their important share in the getting-well process.

Although there has been a good deal of literature accumulated with regard to narcissistic neuroses[18, 20, 21] the therapeutics as well as the prophylaxis of personality pathology still offers a wide scope for practical experimentation and scientific research.[21, 23, 24]

Constitutional and environmental factors, socio-economic status of the family group, community, country, as well as the prevailing culture, religion and morality of the times, all have their character-forming aspects for a given individual. Any prepsychotic personality is a specific being with special assets and liabilities which must all be considered in the treatment balance.

SUMMARY

This paper has tried to characterize schizoid and cycloid prepsychotic personalities, has dealt with treatment of incipient cases of schizophrenia and the manic-depressive psychoses, has stressed the existing difficulties due to the lack of experience and knowledge in changing personality and character traits. Prophylaxis has been pointed out as the salvation of the future, attention was called to the importance of child guidance, mental hygiene, parent education and proper child rearing in a sound milieu.

BIBLIOGRAPHY

1. Southard, E. E.: The Kingdom of Evils. Macmillan Company, New York, 1922.
2. Zweig, Stefan: Masters of Mental Healing. The Viking Press, New York, 1932.
3. Fenichel, Otto: Translated by Lewis, B. D., and Zilboorg, G. Outline of Clinical Psychoanalysis. Psychoanalyt. Press, 1934.
4. Jung, C. G.: Psychological Types. Hartcourt, Brace & Company, Inc., New York, 1924.
5. Kretschmer, E.: Körperbau und Charakter. Berlin, 1926.
6. Bleuler, E.: Textbook in Psychiatry. Transl. by Brill, A. A. Macmillan Company, New York, 1924.
7. Hinsie, L. E.: The Treatment of Schizophrenia. Williams and Wilkins Company, Baltimore, 1930.
8. Hinsie, L. E.: Determinants of adequate psychotherapy in public mental hospitals. PSYCHIAT. QUART., Vol. IX, No. 2, pp. 212-231, April, 1933.
9. Brown, Sanger, II, Potter, H. W.: The Psychiatric Study of Problem Children. State Hospitals Press, Utica, N. Y., 1930.
10. Freud, Anna: Einfuehrung in die Technik der Kinderanalyse. Internat. Psychonalyt. Verlag, Wien, 1927.
11. Freud, S.: Transl. by J. Riviere. Introductory Lectures on Psychoanalysis. London, 1929.
12. Freud, S.: Schriften zur Neurosenlehre und zur psychoanalytischen Technik. Internat. Psychoanalyt. Verlag, Wien, 1931.
13. Boenheim, Kurt: Kinderpsychotherapie in der Praxis. Berlin, 1932.
14. Alexander, F.: The castration complex in the formation of character. Internat. J. of Psychoanalysis, Vol. IV, pp. 11-42, 1923.
15. Brill, A. A.: The rôle of psychoanalysis in the prevention of nervous and mental diseases. PSYCHIAT. QUART., Vol. II, No. 3, pp. 289-298, July, 1928.
16. Brill, A. A.: Psychotic Children: Treatment and Prophylaxis. Am. J. of Psych., Vol. LXXXII, No. 4. Pp. 357-364, January, 1926.
17. Jelliffe, S. E.: The mild forms of manic-depressive psychoses and the manic-depressive constitution. Am. J. of Insanity, Vol. LXVII, pp. 661-676, 1911.
18. Hinsie, L. E., and Katz, S. E.: Treatment of manic-depressive psychosis. A survey of literature. Am. J. of Psych., Vol. LXXXIX, No. 1, pp. 131-183, July, 1931.
19. Waelder, Robert. The psychoses: their mechanisms and accessibility to influence. Internat. J. of Psychoanal, VI, 259-281, 1925.
20. Abraham, Karl: Ein Beitrag zur Psychologie der Melancholie. Berl. Psychoanalyt. Ver., 1923, 30, Juni.
21. Schilder, Paul: Nervous and Mental Disease. Monograph Series No. 50. Introduction to a Psychoanalytical Psychiatry. Transl. by Glueck, B., New York, 1928.
22. Pierce, Clark L.: The phantasy method of analyzing narcissistic neuroses. Med. J. of Research, 1926, 154 f. f.
23. Ferenczi, S.: Sonntagsneurosen. Internat. Ztschr. fuer Aerztl. Psychonal., Vol. V, pp. 46-48, 1919.
24. Schneider, Kurt: Psychiatrische Vorlesungen fuer Aerzte. George Thieme. Verl., Leipzig, 1933.

PSYCHOSES ASSOCIATED WITH HYPERTHYROIDISM*

BY GERALD R. JAMEISON, M. D.,
DIRECTOR OF CLINICAL PSYCHIATRY,
AND
JAMES HARDIN WALL, M. D.,
PLINY EARLE RESIDENT IN PSYCHIATRY, BLOOMINGDALE HOSPITAL

Psychoses due to thyroid disease are not very common, particularly with myxedema and cretinism (hypofunction). In exophthalmic goitre and toxic adenoma (hyperfunction) there is more or less nervous tension and irritability, with a varying degree of emotional instability. Usually, if the thyroid condition responds satisfactorily to treatment, these symptoms disappear gradually. On the other hand, an occasional patient will show more serious nervous or mental manifestations.

The psychosis which develops with hyperthyroidism may simulate a variety of clinical syndromes, so far as mood and trend are concerned. Its organic nature is indicated by defects in orientation and memory, but the life history of the patient needs careful study and consideration to obtain adequate criteria for diagnosis and treatment. Nevertheless, the relationship between hyperthyroidism and an associated psychosis is not always clear.

Hammes[1] has stated that he believes that psychoses encountered with hyperthyroidism could readily be classified with, and have the usual characteristics of, the ordinary psychoses; in other words, that hyperthyroidism is only an associated condition, and not an etiological factor in the mental picture. Walker[2] believed that when a psychosis and hyperthyroidism were associated, the thyrotoxicosis was etiological. White[3] stated that mental symptoms accompanying exophthalmic goitre are those of fear and apprehension, not infrequently associated with hallucinations of hearing and vision. Nolan D. C. Lewis[4] has stated that all symptoms of hyperthyroidism, including the chemical, physiological, and psychological, are exact duplicates of those of fear. Foss and Jackson,[5] in presenting data on a large series of cases of goitre, expressed the opinion that goitre is rarely the cause of mental disorders, and stated that out of 1,700 cases there were only two patients showing

*Read at a meeting for local physicians at Bloomingdale Hospital, White Plains, N. Y., on April 8, 1935.

an acute mental disturbance. Packard,[6] analyzing a series of 82 cases of exophthalmic goitre associated with mental disease, could not postulate a causal relationship, but believed that the psychosis and the hyperthyroidism occurred simultaneously. Some of the patients were depressed, others were excited, some had delusions, some had hallucinations. Rogers[7] found mania occurring in 75 per cent of a series of cases, while Johnson[8] believed hallucinations and delusions, with a predominance of depressive states, to be the rule. He further stated in regard to treatment: "Any patient who has a psychosis, or is delirious, should not be subject to any operative procedure, regardless of the apparent simplicity of the case, for the results are almost uniformly unsatisfactory and frequently terminate fatally." Ingham and Nielson,[9] after reviewing the literature noted above, presented several cases of thyroid psychosis. They concluded that thyrotoxicosis may be the primary cause of an associated psychosis; that the type of psychosis may vary markedly, not only in different cases, but even from time to time in the same patient. They stated that fear and apprehension are classical signs; furthermore that clinical symptoms, such as loss of weight, fatigue, eye signs, and even a thyroid enlargement, may be absent entirely in a frank case of thyrotoxicosis.

The following four cases show some of the aspects of psychosis associated with thyroid disease.

Case One: The patient, a married woman of 38, was admitted to the hospital in a resistive, noisy and excited condition. Her temperature was 104; pulse 120; respirations about 22.

Family history: Essentially negative, except that the father had definite mood swings.

Personal history: She was the second of three siblings. Her birth and early development, as well as adolescence and early adult life, were uneventful. Graduating from college at 23, she married soon afterward. Four children were born, without complication, during the 15 years of her married life. Her physical health was good until the onset of her present illness.

Personality: Extraverted. She was sociable, affectionate, and rather lively. Like her father, however, she was subject to mood swings, and at the age of 20 was thought to have had a mild depres-

sion lasting several months. With the birth of her children she gradually gave up many outside interests and became more and more centered in her home.

Onset of present illness: A year and one-half before she came to the hospital her eldest child, a girl of 12, became a helpless invalid following an attack of infantile paralysis. This child required the patient's almost constant attention, day and night. She worried greatly about the girl, and for several months before she herself became acutely ill her sleep was broken often by her daughter's nursing requirements. She was constantly tired and gradually lost weight. Further tension and worry were caused by financial losses and mounting debts.

A month before her admission the patient received an unexpected legacy of several thousands of dollars. Shortly thereafter she complained of being exhausted and went to bed. The next day she was considered as having "grippe." Her temperature was 101; her face was flushed; pulse was rather rapid, and she complained of pounding in her head. Within a few days she was up and about again, but seemed irritable and unsettled. Then one morning she suddenly left home and went to a general hospital where she asked abruptly to have her tonsils removed. When taken home she said: "I had to get away from it. I am all in. I thought it might be my tonsils. I feel so rundown." Twenty-four hours later she was confused. There were alternating periods of weeping and laughing. At night she appeared quite apprehensive and expressed some delusional ideas, believing that men came into her room to assault her, that her husband had jumped from a window, and that she was being gassed. She thought she heard a nurse say that the patient's liver was to be cut out.

She was taken to a general hospital where the cervix uteri was cauterized for an endocervicitis. Following this two impacted molars were removed. Sedatives were given freely with little effect; she became progressively more excited and confused, and finally had to be transferred to a mental hospital.

Physical examination: On admission revealed a middle-aged woman, who was toxic, dehydrated, and undernourished. She had a high temperature and rapid pulse. There was a systolic mumur

at the apex. Blood pressure was 180/110. A rounded, hard mass, two cms. in diameter, was palpable in the right thyroid region, partially concealed by the upper part of the sternum. There were many fine and coarse tremors of the extremities. Her voice was hoarse. W. b. c. 13,800, with 82 per cent polys; basal metabolic rate could not be determined at this time.

Mental status: She appeared semi-delirious, with manic-like phases of mood. At times she would spring suddenly from her bed, tense and extremely frightened. She would start at the slightest sound, and this would be followed by temporary relaxation and much distractible chatter. She apparently heard the voices of her children. She was partially disoriented, with a definite defect in recent and remote memory, and had some scattered paranoid ideas.

First admission: For the first three weeks the patient continued to run a high temperature, which finally came down by lysis. Tube feedings were given regularly. Prolonged baths were prescribed, and also frequent colonic irrigations. She was noisy and resistive for several hours at a time, and then would become quiet for a brief interval. She occasionally removed her gown, and tried to get out of bed. During the second month in the hospital she began to gain in weight. There was now a mild exophthalmos. There were still marked tremors and flushing, and a rapid, variable pulse. A basal metabolic rate at this time was +37. She was taking iodine, and ice was being applied to her thyroid, when she would permit it. In three months time her physical health had improved considerably, and the gross signs of a toxemia had subsided, although she still had a basal metabolic rate of +35. She was much quieter mentally, but there were still definite signs of defect in orientation and memory. There were days when she would not know the month; sometimes she would be unable to recall the year correctly. At times she said that she knew she was in a hospital, but at other times did not appear to know this. Four months after admission she was clear mentally, but mildly depressed. She had gained in weight, but the thyroid symptoms were still prominent. The basal metabolic rate was +38. Six months after admission she was well mentally. Her blood pressure had dropped to 150/80. Her pulse was now between 80 and 90, and basal metabolic rate was +19.

She weighed 139 pounds, a gain of 24 pounds since her admission to the hospital. She went home shortly thereafter, having been under treatment approximately seven months. She was advised to have her thyroid condition followed by her family physician, with the possibility of surgical intervention if the hyperthyroidism continued. Four and one-half years later her husband wrote: "Since leaving your care my wife has had no indisposition whatever, excepting a very occasional cold, not even requiring medical treatment or advice. I am sure that her recovery was complete. Even the loss of our daughter had no unusual physical or mental effect. I might add that we have seen no occasion for an operation to remove the goitre, which was recommended by the hospital. She now weighs 150 pounds." (35 pounds heavier than when she was ill.)

Second admission: Approximately six years after the patient's discharge she was returned to the hospital in much the same condition, mentally and physically, as when first admitted, except that her thyroid was much more prominent and there were symptoms suggesting compression of the trachea. The precipitating factors showed a striking similarity to those present in the first attack. For about a year she had been worrying over finances, and had lost some weight. Several weeks before her readmission one of her apparently healthy boys collapsed suddenly and was found to have a heart lesion, requiring absolute rest and much nursing attention. The patient cared for him (as she did for her daughter in the previous attack) day and night, was tense and anxious, ate poorly, and lost weight rapidly. Then suddenly, as in her previous illness, she again had what was called "grippe," and went to bed exhausted.

She returned to the hospital with a high temperature, leucocytosis of 14,000, and typical signs of a thyrotoxicosis. Her mental reactions were similar to those described in the first attack. Six months after her admission she had improved sufficiently to warrant surgical attention, and cystic adenoma of the thyroid was removed. Since then her convalescence has continued with some irregularity but complete recovery is anticipated.

Comment: This patient first came to us in her late thirties, physically ill and delirious. Her history indicated that she had had an average type of life, although inclined to instability of mood, based

undoubtedly on a familial tendency. She recovered from a mild depression at 20, thereafter married, and had four children, without complication. Previous to her first admission there had been a prodromal period of about a year when she was greatly worried over the illness of one of her children with infantile paralysis. Economic worries, due to her husband's failing business, added their toll. She slept poorly, ate irregularly and lost weight. Her acute mental disorder seemed to be related closely to what at first appeared to be an attack of "grippe" developing abruptly after she had received an unexpected legacy. Considered in the light of what followed, it is probable that this physical illness was a thyrotoxicosis, the setting for which had been developing slowly for over a year. The physical disease and the psychosis seemed closely related. Throughout her illness her mood suggested a manic-depressive reaction, but her sensorium and memory were never entirely clear until she had recovered, indicating the organic nature of the process. The strikingly similar aspects of her second attack six years later, including the prodromal patterns of physical and emotional stress, together with an acute exacerbation of her hyperthyroid condition (attack of "grippe") precipitating the psychosis, substantiate this formulation.

Case Two: The patient, a married woman of 50, was admitted to the hospital in a mildly confused, restless state, with some feelings of apprehension.

Family history: Inadequate. One sister had a peculiar facial tic. A brother died of hydrocephalus.

Personal history: She was one of three siblings. Though she was delicate as an infant and small child, there were no special physical disorders. She left private school at 16 and remained at home until her marriage at 24. When she was 26 her first child was born, and there was some kidney complication at that time. Two years later her second child was born, and again there was a mild nephritis. For the next 20 years she lived an uneventful life. She traveled some with her husband, who made and lost considerable money, to which the patient showed no unusual reaction.

Personality: An extraverted individual.

Onset of present illness: Indefinite. She passed through the menopause at the age of 47, and at about the same time one of her daughters married. She worried about this, lost some weight, but otherwise seemed as usual. A year later, some months before her admission to the hospital, she was in Europe on a visit, traveled about a great deal, could not sleep, and was very restless. For the first time it was noticed that she had some exophthalmos. She also complained of cardiac palpitation, and a number of coarse tremors were noted. Returning to this country she was treated by several physicians successively for a period of months. She complained of weakness, had vague apprehensions, lost considerable weight, and slept very poorly. Rather abruptly she began to discuss auditory hallucinations. Shortly thereafter she was admitted to the hospital.

Physical examination: She was tremendously emaciated (weight 77 pounds) and in a dehydrated condition. There was marked exophthalmos and also considerable tremor of the extended fingers. Her tonsils were diseased, heart was enlarged; blood pressure 190/120; pulse rapid; thyroid palpable; urine showed albumin and some casts. Kidney excretion was 33 per cent; basal metabolic rate was +42.

Mental status: She was a little apprehensive and inclined to be irritable. She had an idea that some scandal was being spread among her friends about her daughter. She said: "I feel every minute as if something terrible is going to happen. Somehow or other it seems that I should know about it. It seems that I might harm someone. I look terrible. Am I crazy?" She complained that people directed her actions and her thoughts. She had an idea that people were sneering at her. She said she heard voices commenting about her husband; something was said about the possibility of his death. She was partially oriented but was not clear as to the month or the year. There were some defects of recent memory. A month after admission she was less apprehensive. Her blood pressure was lower, and she had gained some weight, although she still weighed only 82 pounds! Her hallucinatory ideas seemed to have subsided. Two months after admission her blood pressure was 134/80; basal metabolic rate +10. She was mildly

euphoric, saying: "I feel fine. This is the first time I have felt well since I have been sick." Four months after admission she weighed 38 pounds more than when she first came to the hospital. She was now speaking of the "foolish delusions" she had had. The thyroid was definitely enlarged, but heart action was regular, not accentuated, and kidney function was normal. She complained of tiring easily and had some edema of the legs. Her convalescence in the hospital continued uneventful, and she was discharged approximately a year after admission, weighing 140 pounds—a gain of 63 pounds since admission. A few weeks later a successful thyroidectomy was performed in a general hospital.

Several years after her discharge she wrote: "I want to tell you how I am. I am entirely well, physically and mentally. As a matter of fact, my delirium had passed away before I left your hospital and has never returned."

Comment: During the menopause this patient developed a hyperthyroid condition which seemed related partially to emotional stress in relation to the marriage of her daughter. For a period of two years she gradually lost weight, but continued rather active and showed little variation in her personality responses. She slept poorly for some months before she came to the hospital, expressed vague apprehensions, lost more weight, and abruptly began to hallucinate. Before the actual psychosis developed she had lost over 50 pounds in weight.

When she came to the hospital her physical condition was of primary importance in her treatment. One of the most striking aspects of her condition was the very marked malnutrition. She weighed only 77 pounds on admission; before she left the hospital she had gained to almost double that weight. Hyperthyroidism is perhaps one of the few conditions in which such an enormous loss of weight may occur without fatal results. In retrospect, one may speculate that if she had come under treatment earlier for her thyroid condition she might have escaped a serious and prolonged mental illness. Her recovery and continued good health since she left the hospital undoubtedly depended upon appropriate treatment of her thyroid disease.

Case Three: A single woman of 30, was admitted to the hospital in an overactive, talkative state. There were periods of irritability and anger alternating with weeping and hysterical laughter.

Family history: Essentially negative, except that a cousin was epileptic.

Personal history: Her birth and early development were normal. She graduated from high school at 17, then held various positions, and eventually graduated from a nurses' training school at the age of 28. Following this she did private duty nursing until the onset of her hyperthyroidism 10 months before admission.

Personality: Described as that of a sensitive, easily worried, stubborn individual, always somewhat hypochondriacal, and with marked feelings of insecurity. She had no particular hobby, but was very interested in her nursing work.

Onset of present illness: Less than a year before admission she began to complain of indefinite aches and pains in various parts of her body. She tired easily, lost weight, and finally developed a tachycardia. Six months before admission she gave up her work, and assumed the rôle of an invalid at home. No definite pathology was found at this time, but three months later a slight exophthalmos appeared, and a basal metabolic rate of +35 was found. She was still losing weight, and her pulse was rapid. About the same time there was considerable emotional distress in the household over a sister who was planning to divorce her husband. The patient soon became much worse, physically and mentally. A diagnosis of toxic adenoma was made, and a thyroidectomy performed. Five weeks after the operation the patient returned home and soon gained weight, going from 114 to 140 pounds. However, the exophthalmos became much worse. She began to complain of looking ugly, spoke of having double vision, and two months before admission was again losing weight. She became depressed, threatened to kill herself, and needed close supervision and attention. Two weeks before admission she developed shouting spells. She was taken to a general hospital and there declared that she could not make a single physical movement. She had to be waited on in every respect. For a time she was quieter, but again became very noisy. Large doses of sedatives were given and she became mildly confused.

Physical examination: She was admitted to the mental hospital on a stretcher, appearing completely exhausted. Her head rolled from side to side, and her arms and legs dangled in the same limp fashion when an attempt was made to get her to stand. There was a marked exophthalmos, her skin was flushed, and her hands and feet were cold and clammy. Thyroidectomy scar was present. She was placed in bed, complaining of tremendous fatigue. Her pulse was 88; there were no tremors; basal metabolic rate was —4.

Mental status: Her mood varied. At times she appeared depressed; at other times irritable. There were many frank delusions and hallucinations. She spoke of "wandering pains" extending from her head to her toes. Her orientation was defective; she was unable to give the month or the time of day. Memory for recent events was poor. After a few days in the hospital she became very hysterical and excited; at the same time she refused to do anything for herself, to walk, or to care for her personal needs. Within a week she changed, began to eat, and expressed the belief that she might be able to help herself. However, she required urging to make even the slightest physical effort. Three weeks after admission she was up and about and taking short walks. Basal metabolic rate varied from —4 to +1. Her pulse varied from 80 to 120. She continued to complain of great physical inertia, and had trouble in concentrating. Small doses of thyroid were prescribed, and it is interesting that within a week her exophthalmos became less marked. She said she felt better, and was more sociable and friendly. Ten weeks after admission her basal metabolic rate had risen to +17. She continued to feel much better, was pleasant and agreeable for the most part, although there were still periods when she complained of feeling exhausted. She was removed from the hospital before she was entirely well, but was regarded as much improved at that time. It is interesting that shortly before she was discharged, in discussing her hyperthyroidism, she said: "I was on night duty for a year without a rest. Then I had to take my mother to a doctor for eye trouble. I wore myself out physically and then my troubles began."

Comment: This patient had a well-established hyperthyroidism, with a temporary remission following a thyroidectomy. It is sig-

nificant that for several months before the thyroid disease was diagnosed she was regarded more or less as a hypochondriac. Later when she improved, after a thyroidectomy, she received much consideration from her family, and when some of her old complaints returned she was treated as an absolute invalid. This resulted in increasing modification of the family interests for her benefit. Eventually the time came when she could not be satisfied in any way. She became entirely helpless, but her shouts and cries made it evident that an abnormal emotional attitude had developed. Noteworthy is the fact that after she came to the hospital her tremendous feelings of inertia, her irritability, and her insistence that she was unable physically to do anything, all changed for the better when small doses of thyroid were given.

In evaluating her mental reaction it is evident that her usual personality traits, in an exaggerated form, had much to do with the clinical picture. It is also evident that the thyroid disease precipitated the psychosis, but the marked hypochondria which followed surgical removal of the thyroid was probably due, to a considerable extent, to removal of too much of the thyroid gland. This is borne out by the fact that she improved when given small doses of thyroid.

Case Four: The patient, a single woman of 55, was admitted to the hospital in a dehydrated state. She was very much frightened, and had many auditory and visual hallucinations. Her family were long-lived individuals, with no history of mental disease.

Personal history: She was the fourth of seven siblings. Infancy and childhood were uneventful. Her schooling was limited, and following this throughout the rest of her life she acted as housekeeper in the home. Her menses began at 14; the menopause occurred when she was 52, three years before her admission here. Her last period was characterized by severe dysmenorrhea. There was no history of serious physical disease. Concerning her personality she was described as thrifty, practical, and a good manager in the home; always lively and talkative, but rather sensitive and quick-tempered. She showed considerable interest in astrology and spiritualism.

Onset of present illness: Four months before admission she was complaining of severe pain in her head. For some time before this

she had been losing weight. She saw several physicians, but paid little attention to their advice. A month before she came to the hospital she was under the care of a physician for three weeks. He reported her as having a hyperthyroid condition. At the time there was a slight exophthalmos; pulse was 135; there were many tremors; basal metabolic rate was +65. She improved for a time under this physician's care, being kept in bed, receiving Lugol's solution and digitan. She ate ravenously, but continued to lose weight, and slept poorly. She was somewhat tense and rather fearful. Then she abruptly developed an acute hallucinatory reaction with many delusions. She thought that various members of her family were being killed and cut up; that there were radios in the walls of her room expressing disagreeable thoughts to her. She believed that she was a criminal and that she was to be sent to Sing Sing. Finally she became so unmanageable that she was brought to the hospital.

Physical examination: She was a middle-aged woman, dehydrated, and much underweight. She had a distinct exophthalmos and a von Graefe sign. Tonsils were submerged and diseased. Her mouth was in very bad condition, with many infected teeth. Her thyroid did not appear enlarged, but a diagnosis of Graves' disease was made because of her coarse tremors, pulse rate of 130, and basal metabolic rate of +67. She was somewhat dyspneic; her lungs were negative. Urine showed an occasional pus cell and trace of sugar.

Mental status: She appeared very excited and apprehensive, with fleeting expressions of horror on her face. She was noisy and resistive. There were many delusional ideas, with numerous auditory and visual hallucinations. She knew where she was, but was disoriented for time and person. Her recent memory was quite poor.

Course in hospital: During the first six weeks she was very much involved with her hallucinations and delusions. She saw monkeys, rats, two-headed snakes, and people with their heads cut off. She saw white cats in the milk. She thought that someone wanted to chop off her arms; again they wanted to chop off her ears. She thought she saw her father in an oven. She heard voices talking

about crucifying her father. She refused to eat; thought there was poison in the food and in the water. When tube-fed she thought that animals were cut up and placed in the feeding. She thought people were throwing knives at her; that all sorts of vile and obscene things were being said about her. Two months after admission she was somewhat improved, had gained in weight, and was less delusional. She had to be cared for in bed, and at first Lugol's solution, luminal, and insulin were prescribed for her. Later some ovarian products were given, and she seemed to do better on these.

Four months after admission she was no longer apprehensive, but was irritable and demanding to go home. She was gaining weight steadily, but at intervals was disoriented for time and place, and her memory was very patchy. After she had reached a fair physical condition, all her infected teeth were removed. Within a week she gained six and one-half pounds. Eight months after admission she was in a negative, antagonistic mood. For many weeks there had been no hallucinations and very few delusional ideas expressed, but she was loud and vituperative, with little appreciation of how ill she had been. She often demanded to leave, and occasionally would strike a nurse. Fourteen months after admission she weighed 139 pounds, a gain of 51 pounds, but her hyperthyroidism was still evident. Three months later she was discharged. A report received seven months later indicated that she was at home, doing well. She stated that her illness was "due to infected teeth and thyroid gland trouble."

Comment: This patient's physical and mental health showed little of unusual significance until her hyperthyroidism was recognized at the age of 55, three years after the menopause. Whether for some time before the hyperthyroidism became prominent she had had prodromal signs of thyroid overactivity was not demonstrated, but it is possible that the menopausal changes had an etiological relationship to her thyroid disease. The onset of her mental condition was associated closely with her acute hyperthyroidism, and the severity and course of her psychosis were related closely to her physical condition. Evidence of the organic nature of the mental illness was in keeping with the usual findings, namely: Confusion of sensorium, including defects of orientation and mem-

ory. Prominent during the acute delirium part of her illness were the frightening hallucinations, of visual and auditory type. Later, as her dehydration and acute toxemia subsided, with a gradual gain in weight, her psychosis settled down into a paranoid, delusional picture, and for many months resembled a chronic condition.

It is noteworthy that when she had recovered she weighed about 50 pounds more than she did when she first came to the hospital, but of greater significance was the fact that this was 30 pounds more than her normal weight before she became ill.

Conclusions and Treatment

Thyroid disease ordinarily does not produce a psychosis. However, given a favorable background, including familial and personality propensities, precipitating factors including prolonged physical and emotional stress may light up a latent thyroid disease, with an associated psychosis.

The four patients whom we have discussed represent cases with serious psychotic manifestations. There are many others lacking the severity and prolonged course shown in these cases. Clinically, each of the four patients exhibited a different type of psychological response. The first resembled a manic-depressive reaction, the second a paranoid delusional state, the third a severe hypochondriacal state, and the fourth an intense hallucinatory paranoid mixture. Nevertheless, certain factors seem common. In the first place, there is a history of prolonged stress, both physical and mental. There is often gradual loss of weight over a period of time, and then abruptly a more rapid loss. At the same time a restless, vaguely apprehensive state seems to be prodromal to the acute onset of the frank psychosis.

The psychosis itself may be ushered in by a toxic delirium. After the initial delirium subsides the moods and trends show no characteristic reaction type, for the most part presenting, in exaggerated form, the personality traits of the individual. However, it is important to recognize that the clinical picture throughout shows definite evidence of the organic nature of the process. This is demonstrated by a more or less intense disorganization of the sensorium, with defects in orientation and memory. Furthermore, these

defects are not always fixed, but change often with fluctuations of the level of awareness and attention—a typical organic response.

To repeat, it may be said, therefore, that the mental disorders associated with thyroid disease vary a great deal so that any type of illness from the anxious, tense, neurotic picture to the frank psychosis may occur. These varying psychological reactions often simulate functional mental disorder, but differentiation is not difficult if careful evaluation of the prodromal period is made, as well as a precise estimate of the sensorium and memory. It is true that defects in the latter are often so slight that they may be overlooked, or again, they may be present at one interview and absent in the next. A longitudinal study will lessen considerably the chances for error.

In considering the treatment of mental disease associated with hyperthyroidism, the preventive phase of therapy rests primarily upon an early recognition of the individual's propensities. It is recognized that the thyroid shows an exaggerated physiological behavior at puberty, and also at the involutional period, so that mild hyperthyroid symptoms, with or without enlargement of the gland, will often be noted at these times. A watchful, conservative attitude toward these patients, with a check on the general physical health, is indicated. Physical examinations may disclose areas of infection such as bad tonsils, bad teeth, or gynecological pathology, and these should be treated thoroughly. In addition, one should modify, if possible, all undue emotional stress and strain. In retrospect, it was easy to note some of these determinants in the cases discussed.

On the other hand, if a patient is on the verge of a psychosis, one should be careful not to add the trauma of an operation or other radical procedures to the already existing precarious physical state unless the causal relationship of the thyroid disease to the clinical picture is without question. Even then a long period of preoperative preparation should be considered. Our first patient, already underweight and physically exhausted, had two infected molars removed, and cauterization of the cervix, at a time when she ought to have been having complete rest. Our second patient was traveling

about the continent, overactive and involved in various new interests, when she should have been at home under the care of her family physician. The third patient was operated when she was struggling with intense emotional conflicts, and the fourth patient saw numerous physicians before it was suggested that she be placed in a hospital. It will be recalled that this last patient had a very bad mouth, with many infected teeth, which could have received attention long before she became acutely ill.

Finally, if a psychosis does develop, it should not require emphasis that the patient belongs in a mental hospital. Facilities for suitable treatment of both the physical and mental aspects are then available. So often delay in this respect results in excessive use of sedatives to control the restlessness and insomnia, while at the same time difficulty in managing an adequate diet leads to rapid malnutrition. The delirium is often related closely to these factors. In the mental hospital nourishments are forced, often by tube-feeding, elimination is managed properly, even though the patient is very resistive, and baths and sedative packs control the restless, exhausting activities. Specific measures directed toward the thyroid disease are then more effective. As the patients improve mentally, much may be done in providing suitable outlets for their energies in regulated occupational and organized physical activities. When they are cooperative and clear mentally, an opportunity of acquiring some knowledge of the psychological factors is also available.

The particular patients cited in this study recovered after months of care and treatment in the hospital, but a certain number of others will drift into chronic psychoses. It is reasonable to believe that early treatment with a better understanding of the various factors involved would lessen the possibility of an unfortunate outcome.

BIBLIOGRAPHY

1. Hammes, E. M.: Neuropsychiatric disorders and hyperthyroidism. Lancet, 48:43-47, Feb. 1, 1928.
2. Walker, W. K.: Hyperthyroidism and mental disorders. N. Y. Medical Journal, 107:391-394, Mar. 2, 1918.
3. White, W. A.: Outlines of Psychiatry. 8th edition. Nerv. and Ment. Dis. Publishing Co., 1921, p. 261.

4. Lewis, N. D. C.: Psychological factors in hyperthyroidism. Med. Jour. and Record, 122: 121-125, Aug. 5, 1925.

5. Foss, H. L., and Jackson, J. A.: Relationship of goitre to mental disorders. Am. J. Med Sci. 167: 724-735, May, 1924.

6. Packard, F. H.: An analysis of psychosis associated with Graves' disease. Am. J. Insanity, 66: 189-201, Oct., 1909.

7. Rogers, A. W.: Graves' disease and its relation to the psychoses. Medicine, 10: 204-209, Mar., 1904.

8. Johnson, W. O.: Psychosis and hyperthyroidism. J. Nerv. and Men. Dis., 67: 558-566, June, 1928.

9. Ingham, S. D., and Nielson, J. M.: Thyroid psychosis. J. Nerv. and Men. Dis., 74: 271-277, Sept., 1931.

RELATIONSHIP OF POSTTRAUMATIC CENTRAL NERVOUS SYSTEM PATHOLOGY TO THE CLINICAL PSYCHIATRIC SYNDROME

BY OSWALD J. McKENDREE, M. D.,
ASSISTANT PHYSICIAN, UTICA STATE HOSPITAL

The mental and physical symptomatology following brain injury for many years has been of interest to those who have had the responsibility of treating posttraumatic cases of this type. As long ago as 460 B. C. Hippocrates noted the grave symptoms and contralateral convulsions following injury to the head.[1] Up to the latter part of the nineteenth century physicians made no distinction between injury to the head and other parts of the body. When cerebral symptoms were present they were believed due to ascending meningomyelitis, to the centripetal effect of strong afferent stimuli on the nervous system, or to a psychologic reaction to the trauma situation.[2] Erichsen employed the term "molecular disarrangement" to explain the mental symptoms in some of his traumatic cases.[3] Strümpell in 1888 noted the necessity of distinguishing between sequelae due to organic changes within the nervous system and those secondary to mental factors.[4] During the period of the World War psychoanalysts pointed out the need of more attention being paid to the possible rôle of affective and subconscious determinants. The increasing use of mechanical devices by man, for example the automobile, during the twentieth century has undoubtedly caused more attention to be focussed on the sequelae of head and brain injuries.

Psychoses due to trauma may be classified under four headings:[5]

1. Traumatic Delirium. These cases develop immediately following head injury; also included here are those which after the trauma show a protracted or chronic delirium which often resembles Korsakow's syndrome, with superficial alertness but marked disorientation, memory defect and confabulations.

2. Posttraumatic Personality Disorders. These were formerly termed posttraumatic constitution. Here are grouped those cases showing posttraumatic changes in disposition with vasomotor instability, headache, fatigability, and explosive emotional reactions, intolerance to alcohol, and sometimes convulsive seizures. A

complete history of previous personality reactions and a careful evaluation of the present reaction are often necessary to rule out psychoneuroses.

3. Posttraumatic Mental Deterioration. Cases following severe or apparently slight head injury with or without an acute or protracted delirium which develop a gradually increasing mental enfeeblement or dementia. Symptoms mentioned under posttraumatic disorders may also be present. Psychoses to be ascribed to arteriosclerosis complicated by head injury may be difficult to differentiate. If the case history shows symptoms of arteriosclerosis before the injury, and the mental and physical examination bears this out, the case should be classified under that heading instead of under the present one. It is to be remembered that the confusion of an arteriosclerotic or a cerebral attack may have brought about the head injury.

4. Other Types (to be specified).

Solomon[6] makes the following clinical classification of posttraumatic mental reactions:

1. Malingerers—psychopathic personalities, litigating paranoids, mythomaniacs.
2. Hystero-malingerers.
3. Conversion hysteria.
4. Fright neuroses.

Hall and Mackay[7] classify the posttraumatic neuroses as follows:

1. Posttraumatic neurasthenia—fatigue and irritability.
2. Posttraumatic anxiety neuroses—anxiety concerning insignificant or imaginary dangers, hypochondria.
3. Posttraumatic hysteria—pseudo-organic symptoms.

In an analysis of 100 cases of head injury Wechsler's[8] patients came under the following headings:

1. Traumatic hysteria.
2. Hysteria and malingering.
3. Malingering.
4. Hysteria and concussion.
5. Traumatic neurosis.

6. Traumatic encephalopathy, concussion.
7. Convulsive state.
8. Fracture of the skull with brain injury.
9. Fracture of the skull without brain injury.
10. Traumatic psychosis.

He states that the diagnosis of traumatic hysteria should be made only in the presence of positive evidence that the trauma has called forth psychogenic symptoms, and that it is an hysterical reaction in an individual who has an underlying neurotic personality make-up. According to this eminent neurologist it is the most common symptom of head injury not accompanied by gross evidence of organic brain injury. There is no history of unconsciousness, or if this be present it is only brief; neither are there any clinical signs of brain injury. No fracture of the skull is present, no blood is found in the spinal fluid and the encephalograms are negative. In the case of concussion, or as it is sometimes called, traumatic encephalopathy, there is found a history of prolonged unconsciousness. The symptoms are entirely subjective and there are only "small signs" of neurological involvement. Psychogenic causal factors are absent and the symptoms are persistent and severe. The encephalogram frequently furnishies supportive evidence. In traumatic neurosis there is no demonstrable cerebral pathology, no hysterical symptoms, and no compensation or litigation playing a prominent rôle. In spite of these facts the patient is unable to return to his work. The example of a steel worker who falls from a great height might be cited.

Finally the comprehensive classification of Adolf Meyer as presented by Read[9] may be mentioned.

1. Direct posttraumatic delirium.
   (a) Reaction with infection.
   (b) After operations and injuries.
   (c) Of slow resolution from coma.
   (d) Associated with confabulations.
2. Posttraumatic constitution.
   (a) With increased reaction to alcohol, infections, disease, etc.

(b) Vasomotor neuroses.
(c) Explosive diathesis.
(d) Hysteroid or epileptoid.
(e) Paranoid reactions.

3. Posttraumatic mental defects.
(a) With aphasia.
(b) Secondary deterioration in connection with epilepsy.
(c) Terminal deterioration.

4. Where trauma is a mere contributing or participating factor.

5. Where injury does not affect the head, there is no noteworthy infection, and the mental disorder is endogenous.

According to Wechsler[10] a person may receive a severe blow to the skull and sustain no fracture and no injury to the brain; he may receive a comparatively light blow and sustain both fracture of the skull and injury to the brain; he may sustain a fracture and no brain injury; he may have no fracture and yet sustain a severe injury to the brain. A person may receive no direct blow and still suffer grave cerebral injury.

It is of interest to note that pure traumatic psychosis is comparatively rare. Harrington reported that of the 5,429 cases treated in the state hospital in Howard, Rhode Island, only 17 could be placed in this category. He divides the mental pictures observed into—

1. Traumatic neuroses.
2. Traumatic psychoses.

According to his observations in the latter group the amount of damage to the brain may vary from extensive destruction to simple concussion. He states that there may or may not be a fracture of the skull and points out that very little has been written relative to the pathology of the psychoses of the posttraumatic type. Referring to Kræpelin he states that autopsies in fresh cases of brain injury often show no extensive lesions outside the immediate point of injury. However later there may be extensive degeneration of nerve tissue in apparently circumscribed injuries. The conclusion drawn therefore is that finer disturbances go on far outside the original point of impact, often nerve cells and fibers dependent upon them may degenerate quite extensively. Harring-

ton[11] believes that in cases of traumatic delirium in which after a few weeks or even after a considerably longer period of time there appears to be a complete recovery, the pathology present following an injury may be an edema of the brain tissue. In addition, if the edema persists in a given area for a considerable period, degeneration of the cellular and other brain structures may occur.

Shepard[12] quoting Jackson includes in his paper the following classification of brain injuries as to their severity.

1. Those cases of very severe crushing injuries in which the patients all die within 24 hours.

2. Cases of mild injury to the brain with unconsciousness that show a normal or only slightly increased intracranial pressure. These cases recover in from 24 to 72 hours and were formerly classed as concussions.

3. Moderately severe intracranial injuries with or without fracture of the skull. They show blood in the spinal fluid and an increase in the spinal pressure of more than 12 and up to 22 milimeters of mercury. There are changes in the reflexes with possibly focal symptoms of paralysis. The coma or convulsions persist for several days.

4. Severe injuries of the brain showing a spinal fluid pressure of more than 22 millimeters of mercury.

In a study of 1,000 cases of acute head injury Wortis and Kennedy[13] found that of the total cases autopsied:

91.8 per cent showed laceration of the brain.
59. 1 per cent intracranial hemorrhage.

Of the 236 cases with laceration
107 were due to contrecoup.
83 were due to direct injury.
46 were undetermined.

Of the 152 cases of hemorrhage
80 were subdural.
35 epidural.
24 subarachnoid.
8 middle meningeal.
5 ventricular.

A bloody spinal tap was obtained in 79, a clear tap in 45, cloudy in 10, and no tap in 154. Acute and persisting mental symptoms were present in nine cases. A history of alcoholism was present in 31 cases. As to the mental states--

Alcoholism was present in	176	Hyperirritability in	117
Coma in	94	Stupor in	173
Confusion in	35	Normal	175
Psychosis with disorientation and irrationality in	104	Dead on admission	25
		Not recorded	1

From the histological point of view Rand and Courville[14] divide the damaged area into three zones:

1. The zone of complete destruction.
2. The zone of reversible reaction.
3. The zone of reactive proliferation.

Zones one and two concern the neuroglia and zone three is the result of proliferation of the fibrillary astrocytes. Stevenson[15] believes that the loss of substance of the brain represented by the increase in the size of the ventricle is due to the phagocytic action of the microglia which carry away broken-down brain tissue in the form of fat granular corpuscles. It is agreed by Hortega, Foerster and Penfield that brain laceration with retention of the products of injury must precede brain scarring. Bagley showed that blood in the subarachnoid system was a cause of hydrocephalus and Kennedy states that Crother's demonstration of the frequency of hemorrhagic spinal fluid in the new-born led him elsewhere to consider the effect of such hemorrhage in increased tendency to convulsions; furthermore he gives the following criteria of head injury sufficient to produce organic change in the brain:[16]

A. Absolute criteria
    1. Roentgen evidence—skull fracture.
    2. Bloody spinal fluid.
    3. Bleeding from the orifices, especially from the ears.
    4. Focal cerebral palsies.

B. Presumptive criteria in the order of their importance
    1. Convulsive states proved to be posttraumatic.
    2. Ventricular distortion proved to be posttraumatic.
    3. History of prolonged unconsciousness.

4. History of adequate trauma with special consideration of the occurrence of vomiting following the injury.

He states that headache and dizziness are well nigh imponderable factors after head injury. However if they persist for more than four months in a man under 60, ununited to any of the first seven premises of brain injury, they are to be regarded as suggested neuroses unfounded on structural change.

The matter of concussion is now viewed pathologically from a different standpoint. Formerly as previously mentioned, it was considered to be a molecular disarrangement but the tendency now is to speak of it as a traumatic encephalopathy.[17] The mechanism of its production is of interest. Steinberg,[18] describing concussion produced by high explosives, states that the elastic skull cap and the cerebrospinal fluid act as transmitting media to the brain substance, while the rigid base of the skull, the fibro-elastic dura mater, the falx, the tentorium, the cranial nerves, and the large cerebral blood vessels place the brain in a more or less fixed position and do not permit the transmitting blows to escape. In addition the higher differentiated cortical neurones due to their younger phylogenetic history have not succeeded yet in establishing a stable metabolism. They are extremely sensitive toward destructive agents. The concussion phenomenon manifests itself in a destruction of the perineuronal and pericapillary spaces which produce a hydraulic shock to the neurone by upsetting the regular flow of the cerebrospinal fluid. In severe cases the fibrillary attachment of the capillary to the perivascular lymph sheet is torn; the capillary blood vessel is injured and minute multiple punctate hemorrhages take place. It is conceivable that catabolic processes originated by the above described factors act as a toxic agent on the uninjured blood vessels inducing a functional alteration of the capillaries with hemorrhages per diapedesis and secondary pathological changes in the adjacent brain parenchyma. He also mentions the vibration of tissues and quotes Ferraro, who says "This varies in intensity according to the strength of the percussion. Every component of the organic tissues possesses a vibratory index which gives it a certain resistance to vibratory action but as soon as the limit is overstepped the tissue undergoes disintegration of variable intensity."

Osnato[19] gives the following symptoms of concussion:

1. Unconsciousness.

2. Deep reflexes, particularly if concussion profound, may be diminished; usually however are rather lively.

3. Soon after, the pupils are quite small, later may be widely dilated.

4. Pallor, cold extremities, sweating, low blood pressure at first; later a rather rapid rise particularly if intracranial bleeding; pulse in beginning may be slow, later rapid, small and thready.

5. In severe cases loss of spincter control.

6. For several days or longer there may be mental or physical retardation, pain accompanied by confusion, irritability, drowsiness at first, restlessness and later anxiety at night.

Cassasa quoted by Osnato and Giliberti[20] reports five cases of seemingly pure concussion. In these there was injury to the head but no laceration of the scalp. Three of the patients momentarily were unconscious at the time of injury; they regained consciousness for from three to 24 hours and again lapsed into unconsciousness. These cases showed irritability, increased deep reflexes, hypersensitiveness to light and sound, contracted but reacting pupils, clear cerebrospinal fluid, no fracture of the skull and intact meninges. Gross sections showed many minute scattered hemorrhages throughout the entire brain. The microscopic picture was strikingly similar to the perivascular reaction seen in epidemic encephalitis. The same authors give a table of symptoms present following concussion which they observed in a series of 100 cases. These were compared with encephalitis but for the purposes of this paper the concussion symptoms alone will be listed.

	Per cent		Per cent
Dizziness	51	Disturbance of sleep	38
Giddiness	6	Emotionalism	10
Tinnitus	19	Fatigability	9
Dimness, blurred or double vision	16	General weakness	21
Pain in eyeballs	7	Convulsion	1
Subective scotoma	3	Palpitation	1
Optic atrophy	2	Stuttering and stammering	3
Headache	69	Nausea	12
Nervous fears	11	Vomiting	6

	Per cent		Per cent
Drowsiness	8	Hypersensitiveness, especially to noises	16
Delirium	11	Irritability and moodiness	23
Restlessness	22		
Depression	8		

Kennedy[21] mentions the fact that suggestion plays a major part in mental life. He compares the procession of workmen who have met with minor injuries to the head and remain often for years incapable of daily effort with polo players and football players who so often need forcible restraint to interrupt their sporting careers. He also states that fear in an injured man can always be influenced by a gloomy medical prognosis, an acquisitive legal opinion or a solicitous or avaricious relative.

Cases are to be found in the literature which support the view that head injuries may directly provoke psychoses where there was no pretraumatic evidence of any tendency in this respect. Hall quotes the cases of Glueck[22] and Nouet[23] as illustrative of this fact. That of the former was a patient previously of normal mentality who following severe cranial injury developed motor aphasia, epileptiform seizures, confusion and a memory defect and later a hypomanic state.

Hall[24] quotes Trotter who mentions a group of phenomena following head injuries which include headache, giddiness, defects of memory, lack of concentration and attention, alterations in disposition and mood and certain kinds of mental deterioration. In his opinion the above group of symptoms is a common sequel to head injuries of all grades of severity and bears no relation to the amount of gross injury that has been inflicted.

Goodwin[25] states that after the immediate effects of injury disappear certain constitutional changes may take place very slowly. The most typical of these is Friedman's complex attributed to vasomotor disturbance. The symptoms are headache, insomnia, mental and physical fatigue, irritability, and certain changes in character. There may be intolerance to alcohol with which memory defect of the retrograde type may be associated. This however is not a part of the complex. These patients become so irritable that their explosive outbursts simulate psychic epilepsy. Posttraumatic neurosis is not believed to occur in people of sound stock

and constitution. They must possess a psychopathic personality. It is possible that neurotics are persons who were subjected to strong emotional impulses when they were children thereby causing their vasovegetative organs to be trained in the wrong direction.

From a legal standpoint head injury is of considerable importance. Some writers feel that injustice is done to patients by physicians who refuse to allow the possibility of cause and effect in progressive nervous disease following severe blows upon the head or spine. Epilepsy, syphilis, multiple sclerosis, cerebral tumor, tabes, progressive muscular atrophy, and concussion of the cord are some of the conditions which may be precipitated or aggravated by trauma to the central nervous system.

Osnato[26] advances the theory that a head trauma may, by increasing the permeability of the cerebral vessels to the spirochetes and the luetic virus, cause a latent syphilis to become active and cerebrally localized.

Read[27] notes that in dealing with mental complications of physical injury several related problems are involved:

a. Those of mental states directly due to trauma of the head which has produced pathology.

b. Abnormal mental states seemingly precipitated by head trauma but probably without definite traumatic pathology—the result of mental rather than physical shock and of endogenous rather than exogenous origin, such as dementia præcox, manic-depressive psychosis, etc.

c. Mental states apparently precipitated by trauma of the head but based upon already existing pathology such as general paresis of the insane, arteriosclerosis, senile changes, etc.

d. Disorders apparently closely associated with trauma to other parts of the body than the head.

Occasional reference is made in the literature to mental symptoms developing when an isolated part of the brain is injured. Kennedy[28] mentions a patient whose emotional tempests vanished after the removal of a piece of bone that compressed the left frontal lobe. Patterson[29] reports a case of left frontal lobe abscess in which the patient was irritable, loud, boisterous, profane and amnesic. Stein-

berg[30] mentions some interesting observations made during operations on the human brain by Foerster. The latter states that when pressure is applied locally to the medulla a particular psychic syndrome develops: Tiredness, numbness and unconsciousness. On the other hand when pressure is applied to the anterior lower parts of the brain stem, the opposite syndrome appears: Intellectual activity, talkativeness and flights of ideas.

Adolf Meyer[31] in his excellent monograph on the Anatomical Facts and Clinical Varieties of Traumatic Insanity considers this problem. He states, "Has the localization of injury as such anything to do with the production of the symptoms, i. e., have we any knowledge of mental disorders which would depend upon clean-cut defects of the brain? This question is answered with the problem of the so-called organic psychoses from focal lesions. The answer is practically negative for small lesions. Even in aphasia, the type of affection which is apt to cut most deeply into the mental functions, we do not of necessity expect a disorder which makes the patient *non compos mentis* except where the lesion is very extensive and interferes chiefly with the so-called leading functions: That of the understanding of meanings and of assimilation and elaboration of speech and signs."

Quoting Phelps he adds, "From 130 cases of wound of the frontal lobes Phelps concluded that the right frontal lobe gives no mental reaction as such, whereas in nearly every instance in which consciousness was retained or regained and the mental faculties were not perverted by general delirium, laceration involving the left lobe was attended by default of intellectual control and that the lesion was usually of the anterior region and implicated its inferior surface. Subcortical disintegration leads rather to defect symptoms, superficial laceration to aberration. Lacerations of or over the convexity produced epileptic or epileptiform disorders. Diffuse concussion and basal fractures lead to initial delirium or paranoic development, that is, a gradual development of a delusional state but also very frequently to intercurrent episodes of a more or less epileptiform nature, spontaneous or elicited by alcohol, grippe, or other usually trivial exciting causes. Where dementia resulted it

was due to the complication with epilepsy, alcoholism, arteriosclerosis, or to the early age and consequent difficulties of growth."

The encephalogram in recent years has assisted much in the clearing up of the diagnosis in obscure cases. Straus and Savitsky[32] cite a case which illustrates this point. A man of 59 complained of heartburn of four years duration. His discomfort frequently ascended along the sternum to the mouth. Sodium bicarbonate gave him no relief. For about a year he had been unsteady on his feet; his gait had become staggering and he would fall to the right side and drag the right lower limb. For a year he had had severe attacks of dizziness; deafness had been increasing for four years. Forty years before admission he sustained a severe injury to the right side of the head and was unconscious for a short time. In this case no evidence of focal disease was found. However an encephalogram showed moderate internal hydrocephalus, a marked enlargement of the subarachnoid space and a marked retraction of the brain on the right side with a rather broad adhesion in the postparietal area. Most of the physicians who had observed this man thought that the reaction was probably psychogenic.

In closing, a word about treatment is appropriate. This is summed up quite well by Hall and Mackay[33] who state that the ultimate understanding and treatment of the posttraumatic psychoses involves a fundamental psychologic study of the individual in his relationships to himself, to his environment, and his associates. Such a study leads inevitably to childhood, early home conditions and the establishment of undesirable behavior tendencies in early life. These behavior tendencies consist largely in an increased self-centeredness, a feeling of inferiority, an improper and often unduly antagonistic attitude toward authority, and an inability to face difficulty with courage, rather seeking refuge in excuses and in illness.

Monetary settlement should be made in a lump sum, long continued payments tending to prolong the neurosis. Medication on the basis of a psychological rationale and physiotherapy which gives the patient an excuse to get better should be used. The physician should not be oversympathetic and gradual weaning from the treatment should be instituted.

From the foregoing several outstanding facts may be noted. Pure traumatic psychosis is comparatively rare. The type of mental symptom exhibited by the patient frequently depends upon the prepsychotic personality make-up. Injury to the brain can occur as a result of causes which formerly were felt to be inadequate. The encephalogram should be employed where there is reason to believe that pathology of the brain exists although no localizing signs can be elicited. The term posttraumatic encephalopathy is interchangeable with the term concussion. Although symptoms are ascribed to certain areas of the brain, posttraumatic lesions of that organ cannot as a rule be correlated with any psychiatric syndrome for purposes of diagnosis, except perhaps in the case of the frontal lobes. Treatment of these cases requires knowledge of the prepsychotic personality. Any therapeutic measures instituted should in due time be gradually withdrawn and a lump sum settlement should be urged where there is a monetary feature to the case.

BIBIOGRAPHY

1. Hippocrates: Genuine works, translated from the Greek with a preliminary discourse and annotations by Francis Adams, London, Sydenham Society, 1849.
2. Straus, I., M. D., and Savitsky, N., M. D.: Head injury, neurologic and psychiatric aspects. Arch. Neurol. and Psychiat., Vol. XXXI, No. 5, p. 898, May, 1934.
3. Erichsen, J. E., M. D.: On concussion of the spine, nervous shock, and other obscure injuries of the nervous system, new ed., Wm. Wood and Co., Baltimore, 1866.
4. Straus, I., M. D., and Savitsky, N., M. D.: Loc. cit.
5. Cheney, C. O., M. D.: Outlines for psychiatric examinations. Published by the New York State Department of Mental Hygiene, Albany, N. Y., State Hospitals Press, Utica, N. Y., 1934.
6. Solomon, A., M. D.: Clinical classification of posttraumatic mental reactions. Indust. Med., Vol. II, pp. 72-80, July, 1933.
7. Hall, G. W., M. D., and Mackay, R. P., M. D.: The Posttraumatic Neuroses. Jour. A. M. A., Vol. CII, pp 510-513, Feb., 1934.
8. Wechsler, I. S., M. D.: Trauma and the nervous system with special reference to head injuries and a classification of posttraumatic syndromes, analysis of one hundred cases. Jour. A. M. A., Vol. CIV, No. 7, pp. 519-526, Feb. 16, 1935.
9. Read, C. F., M. D.: Ill. Med. Jour., Vol. 47, pp. 447-448, June, 1925.
10. Wechsler, I. S., M. D.: Loc. cit.
11. Harrington, A. H., M. D.: Psychoses following head injuries. Rhode Island Med. Jour., Vol. IV, pp. 129-131, Oct., 1921.
12. Shepard, G. W., M. D.: Acute injuries of the brain. U. S. Naval Bull., Vol. XXIV, pp. 61-62, Jan., 1926.
13. Wortis, S. B., M. D., and Kennedy, F., M. D.: Acute head injury, a study of 1,000 cases. Surg. Gyn. and Obst., Vol. LV, pp. 365-370, Sept., 1932.

14. Rand, C. W., M. D., and Courville, C. B., M. D: Histologic studies of the brain in cases of fatal injury to the head. Arch. Neurol. and Psychiat., Vol. XXVII, pp. 847-888, April, 1932.

15. Stevenson, L. D., M. D.: Head injuries, effects and their appraisal, the rôle of the microglia. Arch. Neurol. and Psychiat., Vol. XXVII, p. 787, April, 1932.

16 Kennedy, F., M. D.: Head injuries, effects and their appraisal, evaluation of the evidence. Arch. Neurol. and Psychiat., Vol. XXVII, p. 814, April, 1932.

17. Wechsler, I. S., M. D.: Loc. citt., pp. 522-523.

18. Steinberg, M., M. D.: Traumatic psychosis. Med Bull. of the Veterans' Administration, Vol. VII, No. 9, pp. 826-832, Sept., 1931.

19. Osnato, M., M. D.: The rôle of trauma in various neuropsychiatric conditions. Amer. Jour. Psychiat., new series, Vol. IX, p. 643-660, Jan., 1930.

20 Osnato, M., M. D., and Giliberti, V., M. D.: Traumatic encephalitis, a conception of post-traumatic pnenomena. Arch. Neurol. and Psychiat., Vol. XVIII, pp. 181-214, Aug., 1927.

21. Kennedy, F., M. D.: Loc cit.

22. Glueck, B. J., M. D.· Jour. A. M. A., Vol. LVI, p. 943, 1921.

23. Nouet: Encephale. Vol. XVIII, p. 327, 1923.

24. Hall, G. W., M. D.: The relation of psychotic and neurotic disturbance to head injuries. Ill. Med. Jour., Vol. XVIII, p. 281, Oct., 1925.

25. Goodwin, I. P., M. D.: Traumatic neuroses without external injury of the brain Bull. of the Veterans' Administration, Vol. VII, No. 9, p. 822, Sept., 1931.

26. Osnato, M., M. D.: Loc. cit.

27. Read, C. F., M. D.: Posttraumatic mental disorders. Ill. Med. Jour., Vol. XLVII, p. 447, June, 1925.

28. Kennedy, F., M. D.: Loc. cit., p. 812.

29. Patterson, G. H., M. D.: Left frontal lobe abscess following depressed skull fracture. Amer. Jour. Surg., Vol. XVIII, p. 88, Oct., 1932.

30. Steinberg, M., M. D.: Loc. cit, p. 826.

31. Meyer, A., M. D.: The anatomical facts and clinical varieties of traumatic insanity Amer. Jour. of Insanity, Vol. LX, No. 3, pp. 374-441, Jan., 1904.

32. Straus, I., M. D., and Savitsky, N., M. D.: Loc. cit., p. 952.

33. Hall G. W., M. D., and Mackay, R. P., M. D.: The posttraumatic neuroses. Jour. A. M. A., Vol. CII, pp. 510-513, Feb. 17, 1934.

HEREDITARY AND ENVIRONMENTAL FACTORS IN THE CAUSATION OF DEMENTIA PRAECOX AND MANIC-DEPRESSIVE PSYCHOSES

BY
HORATIO M. POLLOCK, BENJAMIN MALZBERG AND RAYMOND G. FULLER

CHAPTER V (*Continued**)

Environmental Factors in Manic-Depressive Psychoses

HOW LONG DID THE PATIENT REMAIN UNDER PARENTAL CARE?

Under normal circumstances it may be assumed that children will remain in the homes of their parents until marriage, or until an age sufficiently advanced to permit migration for the sake of larger economic advantages. Shorter periods would suggest abnormal family situations.

Of the 60 male patients, 27 resided with their fathers less than 20 years; 26 had lived with their mothers for less than 20 years. The female patients showed very similar results. Of the 95 such cases, 43 lived with their fathers for less than 20 years; 39 lived with their mothers for less than 20 years.

We may also ask how many lived with both parents for less than 20 years. In the case of the males there were 22 such cases; among the females there were 34 cases. Unfortunately we have no corresponding statistics for the general population, but common experience appears to indicate that the patients include higher proportions among those with curtailed periods of parental oversight.

DISSENSION IN HOME DURING CHILDHOOD OF PATIENT

Among the 60 males there was no noteworthy dissension in the home during childhood in 43 cases. In 1 case the patient had no home life, being reared in an orphanage from the age of 3 months. Various types and degrees of dissension were reported in the remaining 16 cases. In 4 cases the dissension was due to alcoholic addiction on the part of the father. In 1 case both father and mother were intemperate. In another case the father was intemperate, and in addition there were constant quarrels between the patient and his brothers and sisters over the ownership of prop-

*The preceding section of this chapter appeared in the PSYCHIATRIC QUARTERLY, Vol. X, No. 1, January, 1936.

erty. In 2 cases the dissension was caused by the mother. In 1 instance she was of the scolding type and very domineering. In the other case she was peculiar and very disagreeable at times. In 4 cases the father was said to have been exceedingly irritable. In another case the father abused the mother and threatened to desert the family. In 1 case dissension arose from the presence of grandparents who quarrelled incessantly with the rest of the family. In another case the father was unable to work, and this was a constant source of worry to the mother. In the last case there was a perpetual emotional strain in the home resulting from a strict observance of religious regulations.

Details concerning the presence or absence of dissension in the home were obtained for 94 of the 95 female patients. In 69 cases there was no unusual degree of dissension. In the remaining 25 cases dissension arose from a variety of reasons, which may be summarized as follows: The patient's father attempted to kill the mother; the father did not support the family and ran around with another woman; the mother was unstable and threatened to kill the children; the father was very strict so that the family was in fear of him. In 4 cases dissension resulted from the father's alcoholism. In 3 cases there was conflict with a stepmother. In 2 cases dissension arose over the presence of other relations in the home. In 1 case the mother was nervous, worrisome and stingy, causing dissension. In another case quarrels arose because the father associated with other women. In another case there was a constant barrier between the children and the father, because of the latter's epileptic condition. In 2 cases the parents had separated. In 1 case the father was cross and irritable to his wife and children. In another the father was overstern and would not permit the children to enjoy any amusements. In another case the father was queer, domineering and egotistical. In still another case there was dissension between the mother and father due to lack of discipline in the home. In 3 cases the mother was reported to be nervous and irritable, quarreling with the other members of the family. In 1 of these cases the father, too, was irritable, because he was dissatisfied with his condition of life in the United States.

Relations Between Patients and Parents (Attitudes)

The relations between parents and their offspring, especially during the period of childhood, have always been looked upon as significant in their influence upon the development of personality and character. In psychoanalytic literature the relations have achieved especial significance, as they are looked upon as causative influences in certain cases of mental disease. It is of interest therefore to examine the relations of the patients and their parents during childhood. These relations are summarized in the following table.

Table 3. Relations Between Patient and Parents in Childhood

	Males		Females	
	Relations with father	Relations with mother	Relations with father	Relations with mother
Affectionate	49	55	82	84
Antagonistic	7	2	7	4
Unknown	4	3	6	7
Total	60	60	95	95

Two of the 60 male patients never knew their fathers, and 3 never knew their mothers. In addition there were 2 cases in which the relations between father and son were unknown. Excluding these, we find that in 49 cases the relations of father and son were affectionate during the latter's childhood, and in 7 cases they were antagonistic. The relations between the mothers and sons had been affectionate in 55 cases, and antagonistic in only 2 cases.

Of the 95 female patients, 4 had never known their fathers, and 5 did not know their mothers. In addition details were lacking in 2 cases. Again excluding the unknowns, we find that 82 of the female patients had had affectionate relations with their fathers, and 84 had had such relations with their mothers.

Affectionate relations were defined so as to include those described as congenial, normal, etc. Antagonistic relations included those in which the patient was habitually disrespectful to his parents. It is interesting to note that among both males and females, higher percentages were indicated as having affectionate relations

with the mother. This may be checked in another manner. Among the 60 male patients there were 47 who were described as having affectionate attitudes towards both parents. Classifying these still further, we find that in 31 cases there was the same degree of affection for both parents; in 4 cases the male patient preferred the father, and in 12 cases the mother was preferred. Among the 95 female patients there were 77 whose relations with both parents were affectionate. Classifying these in the same manner, we find that in 42 cases the degree of affection was apparently the same with respect to both parents; in 15 cases the father was preferred, but in 20 cases the mother was the recipient of greater affection. In no case, however, was the attachment of such a degree as to justify its description in terms of a mother or father complex.

We may also examine the attitude of the parents toward the patient, as affected by the presence or absence of siblings in the home. Thus, among the 60 male patients, 4 had no siblings. Of these 4 patients, 2 were favored by one or both parents, and 2 received no unusual attentions. In 56 cases there were siblings in the home, in addition to the patients. Of these, 13 of the patients were favored by their parents, whereas 43 were not so favored. The same picture is presented by the 95 female patients. Of these, 6 had no siblings. Two of these were favored by their parents; 4 received no special attentions. In 89 cases, in which there were siblings, 13 of the patients were favored by their parents, and 76 received no unusual attentions.

Relations Between Patient and Siblings

Of the 60 male patients, 4 had no siblings. In 4 more cases, the siblings died before the birth of the patient. Of the remaining 52 cases, the relations between the patient and his brothers and sisters were described as cordial in 48, and unfriendly in 4 instances. In the cases of the 95 female patients, there were 6 who had no siblings. In addition there were 3 in which the siblings died before the birth of the patients. In the remaining cases, the relations were described as cordial in 81, and unfriendly in 5 instances.

Physical Condition of the Patient's Early Home

There is no conclusive evidence as to the effects of the physical condition of the home upon the mental characteristics of the patients. Among the 60 male patients, the physical condition of the home was unascertained in one case. Among the remaining 59, the situation was described as normal in 58. One home was always crowded as it was necessary to take in boarders to support the family. Among the 95 females, the physical condition of the home was unascertained in 3 cases. Of the remaining 92, conditions were described as normal in 87 cases, and undesirable in 5. The principal defect was lack of adequate privacy, especially in connection with sleeping quarters.

Character of the Community

The environment of the patients during childhood is summarized in the following table.

Table 4. Environment of Patients with Manic-Depressive Psychoses During Their Childhood

Environment	Males	Females	Total Number	Total Per cent
Urban	51	77	128	82.6
Rural	9	18	27	17.4
Total	60	95	155	100.0

Of the 155 patients, 128, or 82.6 per cent, lived in an urban environment, and 27, or 17.4 per cent, lived in a rural environment during their childhood. The sex differences are slight and probably insignificant. The distribution does differ significantly, however, from that for the district from which the cases were received. In 1930, the urban element included 72.9 per cent of the population of the area. In 1920 the corresponding percentage was 67.6. The childhood of the patients goes back even further, however, probably, on the average, to somewhere about 1900. At that time the urban percentage was even lower. It is evident, therefore, that the urban population produced a disproportionate number of the patients included in this group.

Institutional Care During Patient's Early Childhood

Family disintegration, as represented by the fact of institutional care of children, was not an important factor in the lives of the patients with manic-depressive psychoses. Of the 60 males, only 3 had had any experience with institutions. Two had been in homes for orphans, and 1 had spent several days in jail for using indecent language and stealing. Of the 95 females only 1 had been in an institution, this being a home for orphans.

Physical Condition and Development of Patients During First Five Years of Life

The information included under this heading was necessarily lacking in detail, referring as it does to events more or less remote in the memories of the witnesses. Nevertheless it is reasonably sure that any serious abnormalities would have been recognized and recalled. In only five cases among the 60 male patients was information entirely lacking. Of the remaining 55, the physical development was described as normal during the first five years among 51. Only 4 had abnormalities of one kind or another. One was subject to convulsive attacks during the first three years of life. Another case, which required an instrumental delivery, and weighed 5 pounds at birth, was very sensitive to noise, worrisome, and cried a great deal. He was backward in learning to walk, and talked very little until 20 months of age. Another patient was always delicate and difficult to raise. He began to walk at 3 years. The fourth patient had bronchopneumonia in infancy, and typhoid fever in early childhood. His cheek was badly burned at 4 years of age, and as the wound healed, his head was drawn slightly to one side. The patient was always sensitive about this.

Among the 95 female patients, the early physical condition and development were unknown in 15 cases. Of the remaining 80 cases, 72 were described as normal. Some abnormal condition was present in 8 cases. One patient was born prematurely; her mother was mentally disordered, and also suffered from measles at the time of the delivery. Another patient was also born prematurely, and was always frail. Another patient was always frail and

underweight, and always being doctored. One patient had a very serious case of pneumonia in infancy. Another did not walk until 2½ years of age. She was fat and her bones were too soft. One was a frail child, nervous and easily frightened. Another had tantrums at 2 years of age. The eighth patient was born with a running ear, a condition which lasted several years.

Childhood Activities of Patient

Childhood activities are often an indication of the mental characteristics of the individual. It is interesting to observe, that the majority of the patients had activities which may be described as normal. Information was lacking with respect to 2 male patients, but of the remaining 58, 54 were described as normal. The 4 remaining patients were said to have played by themselves, and to have manifested other seclusive traits.

Information was lacking in 1 case among the female patients. Of the remaining 94 cases, 81 were described as normal, and 13 as abnormal or unusual in some respect. Seclusive characteristics, and refusal to play with other children were the prominent characteristics in this group. In 5 cases the patient indulged in no play with other children, because economic conditions in the home required the child to devote all her spare time to work either in the home or on the farm.

Attitude During Pre-Adolescent Period Toward Playmates of Own and Opposite Sex

Fifty-nine of the 60 male patients were classified under this category. Of this total 33 were described as good mixers with children of both sexes. Of the remainder, 10 were said to have associated with boys only, and 16 were poor mixers with both sexes.

Among the 95 female patients, 67 were described as good mixers with both sexes. This is a relatively higher total than among the male patients. There was one other patient described as a good mixer, but whose relations were affected by sensitiveness over a physical condition. Eight of the patients associated with girls only, and 19 were described as poor mixers.

Adolescent Activities of Patient

By "adolescent activities" is meant participation in behavior such as dancing, fishing, skating, baseball, swimming, music, etc. A judicious amount of such play is recognized as a necessary and wholesome mental and physical stimulus. In one case among the male patients, a history of such activities could not be obtained, though it is known that the patient began work as a farm laborer at 12 or 13 years. Of the remaining 59 cases, 50 were said to have indulged in healthy adolescent play activities. One patient indulged in unhealthy pursuits, such as playing pool and gambling. Another was addicted to drink. Seven patients neglected play in any of the usual forms, primarily because they had to devote their free time to work on the farm.

Among the 95 females, 86 were found to have indulged freely in childhood play activities. In 9 cases there was an absence of such interests. One of these patients never took part in any amusements and led a shut-in, seclusive existence. Another patient was married at the age of 13, and never had time for amusements. In another case the mother discouraged all social activities in the home. In the remaining cases, the patients neglected to play, because they had to assist with their labor either on the farm or in the care of the home.

Attitude in Adolescence Toward Associates of Own and Opposite Sex

Of the 60 male patients, 59 were classified with respect to their attitudes in adolescence toward associates of own and opposite sex. Of the latter, 37 were described as good mixers with both sexes. Ten associated with boys only. Twelve were poor mixers. It will thus be seen that whereas only 33 were considered good mixers with both sexes in pre-adolescence, 37 were so classified in adolescence. The changes were produced as follows: Of the 33 considered good mixers in pre-adolescence, 1 associated with boys only during adolescence, and another became seclusive and avoided companionship. However of the 10 who associated with boys only during pre-adolesence, only 7 continued so during adolescence. Three,

on the contrary, began to associate with both sexes. Similarly, among the 16 originally regarded as poor mixers, 3 began to seek the companionship of boys and girls during adolescence.

Among the 95 female patients, 68 were classified as good mixers during adolescence; 8 associated only with girls, and 19 were considered poor mixers. Evidently, therefore, the characteristics apparent in pre-adolescence, continued among females, through adolesence.

School Record of the Patient

Formal education occupies a large share of time and activity during childhood and adolescence. Influences exerted in such activities must have an important part in shaping the mental life of the individual. It is significant in determining attitudes and personality; it is also important in its preparation for the actual problems of productive labor and self-support. In the following sections, therefore, we shall analyze in detail the school records of the patients with manic-depressive psychoses.

Table 5. Kind of School Attended by Patients with Manic-Depressive Psychoses

	Males	Females	Total
None	1	6	7
Schools in United States:			
Public	38	65	103
Private	..	1	1
Public and private	7	5	12
Parochial	..	2	2
Schools in foreign country	10	13	23
Schools in both foreign country and U. S.	3	3	6
Unknown	1	..	1
Total	60	95	155

Of the 155 patients, 118 received their entire education in the United States. Twenty-three were educated abroad. An additional 6 received their early education in a foreign country, and their later education in the United States. There are no sex differences with respect to the location of the schools. It may be noted that this distribution follows logically from the nativity of the patients. A further classification shows that the majority of the patients at-

tended public schools. A slightly higher percentage of the male patients at one time or other attended a private school.

The degree of education is shown in the following table.

TABLE 6. DEGREE OF EDUCATION OF PATIENTS WITH MANIC-DEPRESSIVE PSYCHOSES

	Males			Females		
	Native	Foreign	Total	Native	Foreign	Total
None	1	..	1	1	5	6
Common school....	20	12	32	46	14	60
High school	22	2	24	20	2	22
College	3	..	3	7	..	7
Total	46	14	60	74	21	95

Of the 60 male patients, 32 had received a common school education, and 24 had attended high school. Three had been to college. One patient had received no education. Important differences are seen, however, in the nativity groups. Among the natives, those with a high school education were slightly in excess of those with a common school education only. Among the foreign born, on the contrary, 12 out of 14 had only a common school education. Among the 95 female patients, 6 had received no education, 60 had attended common school, 22 high school, and 7 college. Compared to the males, therefore, we see relatively more without any education, or with a common school education, or with some degree of college training, and considerably less with a high school education. There are decided differences between the native and foreign females. The former included relatively more with high school and college training.

A further classification may be made of the type of education. In addition to formal education, many had experience with professional or trade schools.

Of the 155 patients, 131, or 84.5 per cent, had had a formal or academic education only; 24, or 15.5 per cent, however, had had additional education of one kind or another. The principal type was attendance in business school, which included 12 cases. Teacher's training schools, and nursing schools included 3 each, these being restricted to female patients. Two males, however, attended trade

schools, where they received training in electrical trades, for example.

TABLE 7. TYPE OF EDUCATION OF PATIENTS WITH MANIC-DEPRESSIVE PSYCHOSES

	Males	Females	Total
Formal only	50	74	124
Other			
Trade school	2	..	2
Business school	4	8	12
Teacher's training	..	3	3
Mechanical dentistry	1	..	1
Art school	1	..	1
Nurse	..	3	3
Other	1	1	2
No schooling	1	6	7
Total	60	95	155

AGE AT ENTERING SCHOOL

The following table summarizes the ages at which the patients entered school.

TABLE 8. AGE AT ENTERING SCHOOL

	Males	Females	Total
5	12	15	27
6	32	40	72
7	9	27	36
8	1	5	6
9	..	..	..
10	1	..	1
11	1	..	1
Unknown	3	2	5
No schooling	1	6	7
Total	60	95	155

Seven of the patients had had no schooling, and the age at entering school was unknown in 5 cases. Of the remaining 143 cases, 72, or 50.4 per cent, entered at 6 years of age. The average age at en-

trance was 6.2 years. Males and females had averages of 6.1 and 6.3 years, respectively. The unusual feature consists in the large total of cases who entered school when more than 6 years of age. This is due to the presence of the foreign born, especially the females, who were not subject, in many instances, to strict school legislation.

Age at Leaving School

The following table summarizes the ages of the patients when they left school.

Table 9. Age at Leaving School

	Males	Females	Total
9	1	2	3
10	2	..	2
11	1	1	2
12	4	..	4
13	1	8	9
14	14	27	41
15	10	8	18
16	8	21	29
17	6	5	11
18	4	7	11
19	1	..	1
20 and over	4	7	11
Unknown	3	3	6
No schooling	1	6	7
Total	60	95	155

The age at leaving school was unknown in 6 cases, and 7 patients never had any formal schooling.. The remaining 142 patients remained in school until they reached an average of 15.4 years. Females had a slightly higher average age than males, these being 15.5 and 15.3 years, respectively. These averages are slightly less than what one would expect in a typical aggregate in New York State, and result, undoubtedly, from the presence of the foreign-born, who, in many instances left school at a relatively young age in order to go to work.

Grade Finished

Table 10 shows the highest grade reached by the patients with manic-depressive psychoses.

Table 10. Grade Finished by Patients with Manic-Depressive Psychoses

Grade	Males	Females	Total Number	Total Per cent
None	1	6	7	4.5
Elementary school				
3rd grade	2	1	3	1.9
4th grade	2	4	6	3.9
5th grade	2	6	8	5.2
6th grade	7	9	16	10.3
7th grade	2	6	8	5.2
8th grade	10	30	40	25.8
High school	24	22	46	29.7
College	3	7	10	6.4
Unknown	7	4	11	7.1
Total	60	95	155	100.0

Of the 155 patients, 81, or 52.3 per cent, had gone no higher than the grades of the elementary schools. Of this total almost half had completed the 8th grade. Those who had been to high school included 46, or 29.7 per cent. College included 10 cases, or 6.4 per cent. Sex differences are apparent as follows: 25 of the 60 males had attended elementary schools only, compared with 56 of the 95 females. High school, however, included 24 of the males, and only 22 females. Relatively more females had attended college.

Number of Years in School

Those patients who had formal education had entered school at an average age of 6.1 years and had left at an average age of 15.4 years. On the average, they had spent 9.2 years in school. This is less than the average number of years that would be found in a group leaving school today. But legal regulations with respect to age at leaving school were not so stringent a generation ago, and a greater proportion left before completing high

school. The number of years of schooling are shown in detail in Table 11. There are no sex differences, males and females both spending 9.2 years in school, on the average.

TABLE 11. NUMBER OF YEARS OF SCHOOLING OF PATIENTS WITH MANIC-DEPRESSIVE PSYCHOSES

Years	Males	Females	Total Number	Total Per cent
None	1	6	7	4.5
1	..	..	..	..
2	..	1	1	0.6
3	3	1	4	2.6
4	..	1	1	0.6
5	3	3	6	3.9
6	3	5	8	5.2
7	4	11	15	9.7
8	10	19	29	18.7
9	9	10	19	12.3
10	11	15	26	16.8
11 and over	13	21	34	21.9
Unknown	3	2	5	3.2
Total	60	95	155	100.0

REASON FOR LEAVING SCHOOL

Of the 60 male patients with manic-depressive psychoses, 1 never went to school, and in 13 cases the reasons for leaving school were unknown. Of the remaining 46 cases, 29 left upon the completion of formal schooling and 13 left to become self-supporting. Four patients had to leave before the completion of the school course in order to help at home, usually by adding to the family income.

Of the 95 female patients, 6 never attended school, and in 19 cases the reasons for leaving were unknown. Of the remaining 70, 45 left after completing school, and 8 left to become self-supporting. Twelve patients left before completing school requirements in order to help at home in various capacities. Three patients left because of illness, and 2 in order to marry.

Most of those leaving school after graduation are comparable with those leaving in order to become self-supporting, inasmuch as they all sought employment upon the close of their school careers.

Attitude Towards School

Most of the patients expressed a friendly attitude towards school. Of the 155 patients, 123, or 79.4 per cent, were so classified. Only 14, or 9.0 per cent, expressed antagonism towards teachers or the curriculum. A sex difference is suggested. Omitting those who never attended school, and the number whose attitudes were unknown, we find 8 males out of 54 expressing unfriendly sentiments with respect to school, as compared with only 6 of 83 females.

Table 12. Attitude Towards School

	Males	Females	Total Number	Total Per cent
Friendly	46	77	123	79.4
Unfriendly	8	6	14	9.0
Unknown	5	6	11	7.1
Never atended school	1	6	7	4.5
Total	60	95	155	100.0

Summarizing the data with respect to school life, it does not appear that we are dealing with a group that differs in essential respects from average corresponding groups of the general population. No relation is apparent between the school experience of these patients and their subsequent mental disease.

In the next installment of this series, we shall deal with events more intimately related to the development of the mental illness. Environmental factors immediately preceding the breakdown will be considered in detail.

(TO BE CONTINUED)

BOOK REVIEWS

Emotions and Bodily Changes: A Survey of Literature on Psychosomatic Interrelationships, 1910-1933. By H. Flanders Dunbar, M. D., Ph. D., Columbia University Press, New York, 1935. 595 pages. Price $5.00.

By means of a careful compilation of 2,251 selected references expanded in most instances to brief digests of the many representative authors' views, ranging over the entire field of psychosomatic interrelationships, an attempt is made to survey what is known. It must be said that Dr. Dunbar's personal viewpoint is not allowed to obtrude unduly, that she terms the book a bibliography, and that the digests appear frequently as direct quotations. All schools of thoughts, especially the psychoanalytic, are represented as they bear upon the very present problem of mind and body, and their internal and external adjustments. However, a broader orientation is presented here—that of the organism as a whole. "Psyche and soma are actually two aspects of a fundamental unity." To all, that is obvious, but in practice few demonstrate the application of this principle. We are too preoccupied with the differentiation of functional from organic disorders to treat both etiological facets which almost invariably have joined hands to produce the malady at hand. Peculiarly enough, no better proof of that indictment can be cited than in the grasp of psychiatric principles and causal relationships displayed by certain authors in the various specialties, as quoted in this book. Upon analysis however, one may best attribute the former fault to psychiatry which until lately (as also shown in this volume) has had little that was practical to offer the cardiologist, gastroenterologist and even the orthopedist. Thus, perhaps psychiatry should ultimately form the cement uniting the various specialties into the broad field of medicine.

To introduce the text the author quotes the more modern viewpoint as expressed by Socrates about 500 B. C. to the effect that the cure of many diseases was unknown to the physicians of Hellas because they were ignorant of the whole, referring to mind *and* body. Further it is stated that perhaps this work will clarify the field of research in any specialty where it touches upon psychosomatic interrelationships. That is to say that it is an attempt to correlate and evaluate the actual scientic information available, achieved along the lines of the several specialties. In this regard the writer remarks: "The young psychiatrist in particular finds it difficult to get his bearings. In seeking a field of research, he succumbs only too often to one

of two fates. On the one hand, he may float around vaguely, intrigued by a number of important problems, all of which are peculiarly difficult of approach, and then become submerged in a more or less antiquated type of routine clinical practice alleviated by philosophical speculation. On the other hand, finding himself drifting, he may reach out toward some problem which is specific, scientific, and definable, only to find when he gets through that he has done an interesting bit of research in biochemistry, but has really ceased to be a psychiatrist."

To judge of its scope, the volume consists first of a section devoted to orientation and methodology introduced by a discussion of the many conceptions of psyche-soma as propounded by Prince, Ritter, Carrel and Coghill, to name but few. This discussion is concluded by a consideration of environment and *Weltanschauung*. Therefollowing is a survey of the problems of acute and chronic illness. Not the least engaging of the references included here is that to a paper by Higier citing the physician as a "pathogenetic agent." Of course the obverse attitude (a too-common fault of the psychiatrist) consisting of overlooking the somatic, receives attention. An abstract from Deutsch merits repetition: "Psychologically speaking, to remain or to become organically healthy the individual must either invest his libido or get rid of his anxiety." The latter is to be accomplished by somatic discharges of anxiety (he continues) as in attacks of pylorospasm, migraine, asthma and so forth. With accumulation of anxiety the symptoms of an organic disease are enhanced. Part One ends with a particularly interesting review of the problem of measurement of the affective processes in physical or physiological terms. The difficulties of evaluation of results with the psychogalvanometer are exemplified, a table of biochemical findings correlated with personality disorders is presented, and a discussion of the cardiotachometer and X-ray in this connection follows. The author concludes with an explanation of the confusion in recorded results. This is attributed to disregard of the time factor, actual emotional states (contrasted with diagnostic labels), the "second derivative," and more than one physiological reaction. Accordingly it is stated that: "Change of no one quantitative element as specific for any emotion has been proven thus far, but increase or decrease of lability seems to be a constant concomitant of affects and psychic states."

Part Two concerns itself with the literature as grouped under the following headings: nervous system, musculature, endocrines, general metabolism and heat regulation, cardiovascular system (with special attention to an-

gina pectoris and blood pressure), repsiratory system, gastro-intestinal system, genito-urinary system (with particular emphasis on gynecology), the special senses, skin and bones, including odontology. Because of the inclusion of illustrative case histories of "organic disease," this section will be read with most interest by the general practitioner, and perhaps do most to convert him to Dr. Dunbar's thesis. He might be impressed, for instance, by well-substantiated reports of hyperthermia nervosa, by "the fact that the neurotic breakdown of the physician between forty and fifty so often takes the form which the patient himself designates as pectoris," and by the successful psychoanalytical treatment of certain cases of asthma. With reference to the latter, various views are brought forward suggesting that the reaction of the allergic individual as a person contains an affective component which may assume the rôle of the initial stimulus.

Although we may fail to agree, we believe that the writer would have us take the quotation from Pascal, set at the head of Part Three as her apologia for the book in its entirety. That reads: "Though one may say that I have told nothing new, the arrangement of the material is my own." Under the title of therapeutic considerations, Part Three considers all sorts of treatment techniques from the psychic components in drug therapy to hypnosis, concerning which much is said throughout the volume. Note is made of recent publications bearing titles of healthy omen, namely, "Psychotherapy in Gynecology" or "in General Practice." The plea is reiterated that the physician hold psychologic treatment as "scientific" as any other.

Obviously, the section of biliography is extensive and represents only the wheat culled from an enormous literature. The indices seem complete, the literary style commendable, and the writer exercises consistent critical judgment. Frequent comparisons are pointed between theoretical, experimental, and clinical material.

Dr. Dunbar in her Conclusion expresses the belief that perhaps a textbook devoted to psychosomatic interrelationships should never be written. She feels that this subject should form an integral part of the textbooks of general medicine. The present work does offer important clues to research programs and provides extensive bibliographical leads. It should be read by any physician presuming to possess a broad working knowledge in any field (however narrow) and particularly by psychiatrists, as an excellent elaboration of the organismal theory.

Practical Clinical Psychiatry. Fourth Edition. E. A. STRECKER and F. G. EBAUGH. P. Blakiston's Sons & Co., Inc., Philadelphia, 1935. 705 pages. $5.00.

This fourth edition of a deservedly popular textbook amplifies the fine quality of its predecessors. Much of its substance has been rewritten and a chapter on "Psychopathological Problems of Children" by Dr. Leo Kanner has been added. This chapter presents an elementary but inclusive discussion of psychiatry as it applies to children and is a distinct asset to the book making complete its survey of the general field of psychiatry. The volume, avowedly the expression of an "American School of Psychiatry" based on the psychobiological approach of Adolph Meyer, who contributes a foreword, includes a chapter outlining the fundamental concepts of mental illness as seen from this viewpoint. The material here is simply yet accurately stated, in a manner which should gain the interest of the student. The American Classification of Mental Disorders is given in full but for descriptive purposes the material is, as before, divided into reaction types.

The volume is intended as its subtitle recommends, "for Students and Practitioners" and several features make it particularly appropriate for this group. While espousing the views of one particular school of thought, it yet gives mention to the other major schools. Controversial matter is openly treated as such. Conclusions follow a general middle-of-the-road course within reasonable limits, leaving theoretical discussion for more advanced works. The case-presentation method stresses the consideration of the total individual, heredity, life history, and clinical picture, avoiding the danger of undue emphasis upon the symptom-complex. The bibliographies appear well chosen, sufficient to serve as guides to further and more detailed study.

The general subject matter is well subdivided, a proportional amount of space and emphasis being given to each topic. One high spot is the stress on the favorable aspects of mental illness, a special point being made of the futility of emphasizing the unfavorable prognosis of dementia præcox. Another is the plea for the recognition of the functional nature of physical complaints providing complete physical examination has ruled out the presence of definitely etiological organic pathology. The discussion of this latter point is exceptionally broad and convincing. The case-histories are well chosen but those of Dr. Kanner seem to paint too bright a picture of the results obtained in the treatment of children.

For these many reasons, this textbook may again be unhesitatingly recommended to students of medicine and psychiatric social work, as well as to the general practitioner as a foundation for knowledge in psychiatry.

Twentieth Century Psychiatry. By WILLIAM A. WHITE, M. D., A. M. Sc. D. W. W. Norton and Company, Inc., New York, 1936. 198 pages. Price $2.00.

The developments under way at the present time and during the last 40 years in the field of mental medicine are accurately and comprehensively set forth by White in this volume, which comprises the Salmon lectures for 1935. It is not a chronological resumé but a dissertation depicting the present situation and the trend toward the future.

Though psychiatry lagged behind surgery and internal medicine during the late decades of the nineteenth century, it finally received its stimulus, long overdue, and which came from an unexpected quarter. Surgery and internal medicine had received an impetus from the discoveries of Pasteur and the work of Lister, which had forced upon the medical men of that period new and bewildering conceptions of the processes of disease. A generation of practicing physicians had to pass away before the "germ theory," as it was then called, overcame the inertia of prejudice and became the accepted science of bacteriology. History has repeated itself in mental medicine; the advance has not been accomplished without opposition and inertia on the part of a considerable element of medical men, who could no more stomach the newer dynamic psychology than could their fathers the novel conceptions of infection and antisepsis. White, however, makes little reference to old quarrels, rather he looks forward to further advance along these lines.

The author, after presenting a brief picture of the newly-christened state hospitals of 40 years ago and their equipment, proceeds to trace the developments of psychiatry, which began in the institutions and clinics and with gathering momentum spread into many new fields related to medicine.

The developments in psychiatry have reacted and interacted with the related schools of thought and psychiatry, he shows, has contributed as much to the elucidation of the other systems as it has received from them—possibly more. The organism as an energy system, the organism-as-a-whole, the maturation hypothesis and others are concepts recently achieved which pave the way to broader comprehension of the biological sciences of which psychiatry is now seen to be an integral part. All these and other aspects of modern psychiatric thought come under his searching analysis and review, and the illumination which he throws upon them is stimulating and thought-provoking. White for years has held his position as leader of the progressive element within the profession; these lectures will enhance his prestige and they will provide the young men coming into the work a clear perspective of the field and a better understanding of the developments going forward in many directions.

Neuroanatomy: A Guide for the Study of the Form and Internal Structure of the Brain and Spinal Cord. By J. H. GLOBUS, B. S., M. D. William Wood and Co., Baltimore, 1934. Price $3.50.

This volume is the sixth edition, revised and enlarged, of a well-known textbook, extensively adopted in our medical colleges. In some 120 pages the essential structures of the central nervous system are described in their gross morphology and mutual relations. The book is conceived for strictly practical purposes; that is, for the medical students whose foremost need is an anatomical basis for the understanding and interpretation of the main problems of clinical neurology; no attention is given therefore to discussion of the numerous aspects of nervous morphology which are still unsolved.

The arrangement of the descriptive material follows in general the lines of the classical textbooks, treating first the external appearance of the brain, then the gross structural subdivisions in the interior of the cerebral hemisphere, the pons, medulla and cerebellum and finally the topography of the spinal cord.

The second half of the book is given up to 53 plates consisting of unfinished drawings, uncompleted diagrams and unlabelled microphotographs of various structures of the central nervous system. The task of ordering, finishing and labelling the data is left to the student. The plates are carefully selected and meticulous instructions are offered even as to the color which the student should use in tracing the different pathways. This will prove a very helpful method for training the student to think of neuromorphology in terms of a series of nuclei and tracts as is obviously the practical goal of neuroanatomy. The book will be of benefit to the medical student as a clear introduction to more extensive treatises.

Comparative Psychology. Volume I, Principles and Methods; and Vol-III, Vertebrates. (Volume II, Plants and Invertebrates, is in preparation.) By C. J. WARDEN, Ph. D., T. N. JENKINS, Ph. D., and L. H. WARNER, Ph. D. The Ronald Press Company, New York, 1935 and 1936. Volume I: 395 pages, plus 111 of bibliography and indices; Volume III: 420 pages, plus 140 of bibliography and indices. Price $4.50 each volume.

The authors have achieved in this series an encyclopoedic work that is indispensable to the student of comparative psychology and that should prove extremely useful to the student of biology and comparative anatomy. The two volumes already released display a breadth and intensity that has been unequaled in the literature on the subject. A rough estimate of the

bibliographical entries in both books shows between 3,500 and 4,000 references culled from the studies of over 1,500 investigators. There are numerous items dated as recent as 1935, so that no one could say that the material is stale.

Volume I, on principles and methods, carries the reader in historical perspective through the period before Darwin, the anecdotal period of Darwin's immediate influence, and the experimental period of Lubbock's pioneering. The natural science viewpoint is discussed in the light of the interrelationship between psychology and biology. In the chapter on biological foundations, no stone is left unturned to provide sound orientation in all the aspects of evolution. Volume III, on vertebrates, is phylogenetically classified from pisces to primates.

One might continue commenting on the exhaustiveness of the work if space permitted, but it should suffice to say that whatever has been discovered in the field of comparative psychology and its contributory studies, is to be found within these covers. The forthcoming volume on plants and invertebrates should be eagerly anticipated by students and writers.

Gestalt Psychology. By GEORGE W. HARTMAN.. Ronald Press, New York, 1935. xiii + 325 pages. Price $3.50.

Gestalt psychology is and has been attracting a great deal of attention not only in professional psychological circles but in psychiatry as well. Since it has been almost entirely formulated by German psychologists and since most of the literature on the subject is in German, ready access to the material has not been possible and general knowledge of the theory has been limited to either second-hand sources or to specialized treatises which have been translated. It is true that both Köhler and Koffka have published expositions of Gestalt psychology in English. However, their presentation was necessarily from the viewpoint of the original German philosophical concepts so that it has been difficult for American readers to orient the material in the American idiom.

Professor Hartman was trained in America and spent some time in Germany investigating and thoroughly acquainting himself with Gestalt psychology. His presentation is designed to acquaint the American reader with the general concepts of this brand of German psychology in terms of current American thought. He considers the theory from the historical standpoint, takes up the theoretical considerations which have been used in its formulation and then proceeds to a review of certain of the experiments which have been conducted in light of the Gestalt theory. He has selected

for review typical experiments in perception, memory, learning, insight and emotion. He concludes the book with a discussion of the practical applications of the Gestalt theory in the fields of mental pathology, personnel work and education, together with a chapter reviewing the most pertinent criticisms which have been offered against the Gestalt theory.

This exposition of Gestalt psychology has much to recommend it in that it is simply written and readily understandable. The illustrations chosen and the experiments cited are placed in such a light that the interested reader is not at a loss to grasp the general concepts involved. However, this simplification has the attendant difficulties of any simplification. The specialist working in the field will not be satisfied with Hartman's exposition, since it does neglect many of the finer points which are necessary for exact orientation. Many experiments, which have been conducted and which are of real importance, are totally neglected while experiments are cited and dealt with at length which are really of no great importance other than that they are illustrative. For the reader who wishes to acquaint himself with the general notions of the Gestalt theory and is not overly critical of the final implications and finer shades of difference, Hartman's book is to be recommended. It is not, however, a book for specialists.

Diagnostic Criminology. By LOWELL S. SELLING, M. D. Edwards Brothers, Inc., Ann Arbor, Michigan, 1935. 155 pages, plus appendix and bibliography. Price $2.25.

This work is as practical as it is brief. Much has been written about popular and juridical incredulousness toward psychiatric interpretations of criminal behavior, so that the author's remarks in his introduction are not novel, but would seem to be excellent material for the education of the public on this score.

The chapter on the history of criminology is terse, the essentials of past and present attitudes being condensed for ready absorption. It is well that Dr. Selling pays tribute to Lombroso, whose erroneous preoccupation with anthropological measurements should be seen in the larger light of its contribution to the modern conception that "the criminal is more important than the crime."

The third and fourth chapters are devoted to the examination of the offender, adult and juvenile. It is in these chapters that the author outlines his practical suggestions for the organization of a criminological clinic. The exposition of the procedure is for the greater part confined to factual considerations, with little in the nature of dynamic interpretation—general

statements being preferred and the knowledge and experience of psychiatrist-criminologist being granted. The use of psychometrics is discussed, and the proper relative importance of the tests well stated. We read: "Since the position of the psychologist is still a dependent one, too much must not be expected of test findings, and the criminologist must be wary about making his diagnosis on these findings alone, except when the method of diagnosis by elimination has been used and no pathology has been found except that indicated in the test results." (page 56).

The "important (psychopathological) syndromes" are treated with understanding and in a scope appropriate to the space allowance.

The book is avowedly addressed to court clinic psychiatrists, whose qualifications for an appointment, from the legal standpoint, need be "a modicum of psychiatric experience" (from the author's note). "It is for these, in the main," the writer states, "that the present volume is written." Others, too, should certainly profit by so condensed an approach to this increasingly important field. Much of the material can be read to advantage by the intelligent layman.

Nothing is lost in the use of lithotype printing, the type being rather small, but clear.

The Individual Criminal. Studies in the Psychogenetics of Crime. By BEN KARPMAN, M. D. The Nervous and Mental Disease Publishing Company, Washington, D. C. 299 pages, index and inserted charts. Price $4.50.

In view of the modern psychiatric opinion that crime is not a disease of society, but a symptom of deeply imbedded psychic turmoils that find their outlet in antisocial behavior, this approach to the problem of the individual criminal is commendable. Unfortunately, however, the material in Dr. Karpman's book is so dispersed that the reader is likely to be more confused than enlightened, at many points.

Five cases are presented, divided into sections labeled "interpretational," "diagnostic," "psychobiopsy" and "crime mechanics." The least satisfactory of these sections is the one called "interpretational," in which the life history of each individual is recounted in too great detail, the incidents following one another with kaleidoscopic rapidity and with only touch-and-go explanations of the personality factors. There is a certain lack of cohesion and an apparent reluctance on the part of the author to exclude nonessentials. The interpretations are much too brief to carry conviction.

Satisfactory in most instances, are the "diagnostic" sections. In these, there is first an analysis of the intellectual and psychic makeup of the individual; then several possible diagnoses are suggested, each being discussed adequately. Herein lies the real value of this book.

One is puzzled, in reading, on page 67, a purported dream of one of these criminals. Obviously offered as a verbatim report of the dream, the narrative is unconvincing. The frequent recurrence of such definite expressions of time, such as "during my first year," "the next day," and "on Wednesday," belies the genuineness of this account as true dream material; in fact, the entire story of the dream is more of a tribute to the patient's imaginativness in relating it, than to his candor. Witness this further excerpt from the same dream: "After talking *for about thirty minutes* I said goodbye." (editor's italics)

A glimpse of what psychiatry may contribute to the criminology of the future is seen in the comment on a specific case, on page 100, where the author states: "What appears to be superficially a psychopathic type of behavior may, on closer analysis, be shown to be an environmentally and neurotically conditioned set of reactions that may, if treated early, respond favorably to psychotherapeutic approach." There is a mark at which psychiatry may well aim! The possibilities are discussed in a general way in "Preliminary to the Psychotherapy of Criminals," which closes the book.

The scheme of this work is excellent, the execution not so smooth-running as might be desired, but it furnishes an impetus to other similar studies. The general plan of Karpman's work with some modifications is worth following; for this reason, psychiatrists and psychologists who contemplate direct or indirect contact with the criminological phases of their professions may benefit from a reading of "The Individual Criminal," which is Number 59 of the Nervous and Mental Disease Monograph Series.

Sterile Sun. By CAROLINE SLADE with introductory note by the Rev. John Howard Milish. The Vanguard Press, New York, 1936. 156 pages. Price $2.75.

Mrs. Slade was formerly a social worker and her professional contacts gave her the opportunity to acquire a deeper insight and better understanding of the unhappy lot of the fallen woman than could be acquired without her sympathetic attitude. The narrative is in the words of three prostitutes, who relate their life history as though spoken by themselves: The story of Sue who, born of a poverty-stricken family, was led into prostitution at the age of 12 through a chain of circumstances beyond her control; the story of Allie, who began life in an orphan asylum and that of Winkie,

whose mother set her the example. The story is told with all the coarseness, vulgarity and profanity of the underworld jargon; no revolting detail is omitted but if there can be artistry in filth Mrs. Slade has achieved it. It is a terrible arraignment of the existing social order in which such things can go on. It is an arraignment too of the stupidity and inefficiency of the welfare workers who are incidentally mentioned, their smug advice and lack of understanding of the stark poverty which stalks like a spectre at the heels of the street walker, the hunger and wretchedness of her life. It portrays the contempt in which they are held by their "clients" who, if they would, could give *them* useful advice on how to study and understand the conflicts of the prostitute. "The Salvation Army gets after me. They are good scouts, all right, they take you in and treat you right only they call you a sinner too easy. It's too easy on their lips. I am a sinner all right, but it just don't set too good to be called it too much and prayed over."

The reader will gain a new insight into this "oldest profession in the world" and perhaps new ideas of how best to deal with the problems it presents.

Allie's comments upon the methods of the Salvation Army indicates that what the street walker needs is practical assistance. What she craves is to gain a feeling of security for the future. She knows better than anyone else that her career will be a short one, that soon she will be friendless, without a means of self-support and she looks forward to a future more miserable than her present unhappy lot. "I have to get good and drunk to stand it to live."

It is predicted that Sterile Sun will create a profound impression upon the professional people permitted to buy it. Through all its filth and vulgarity runs a powerful influence for morality and here is where the art of the author appears. Rev. Milish in his foreword cautions against its falling into the hands of adolescents and he is right, it is too horrible to be read by any but those interested professionally in the problems it portrays, but no girl reading it would ever be tempted into the path which leads to destruction.

Criteria for the Life History. By JOHN DOLLARD. Published for the Institute of Human Relations, by Yale University Press, 1935. 188 pages. Price $2.50.

A life history may be the product of a biographer, a social worker or a psychiatrist. However varied their approaches, a certain bond exists among them in that they seek to interpret human life. The author feels that they may learn much from one another, and from him.

Cultural factors are uppermost in the criteria he offers us. We are told that mechanistic rationale is overdone and that instinctual patterns must be seen in the light of their social implications, rather than as a "package" of organic elements. In criterion one, he states. "The subject must be viewed as a specimen in a cultural series." This point is well supported on page 18: "If we begin by postulating a set of instincts . . . then we do not need the culture to explain the behavior of an individual. The instincts . . . will work themselves out naturally in social behavior . . . We have indicated, however, that we cannot make such instinct assumptions because we know of the great variability of behavior from group to group, and we would be forced then to postulate a new set of instincts for each such group."

Briefly, the viewpoint is "set off against the cross-cultural institutional view of behavior." It shows "the culture in long-section, the culture as coagulated around a center of feeling."

Dollard's aim, which is laudable, is to "reduce confusion in the life-history field and to offer a blend structure of principles from the fields of cultural studies and clinical psychology." In his elaboration upon the latter half of this stated aim, he presents several outstanding individual studies, including notably Alfred Adler's "The Case of Miss R" and Freud's "Analysis of Phobia in a Five-Year-old Boy." (*Kleiner Hans*). Referring to the Freudian concept system, he says, "What the technical student of culture has to add can be added without essential damage to the system, and what it brings to cultural studies is most urgently needed." In evaluating the *Kleiner Hans* document, as well as the others in the book, Dollard exhibits keen insight into the schools of thought current in psychoanalysis, sociology and autobiography.

It is an altogether absorbing piece of work, unique in both approach and execution. The writer is a research associate in sociology in the Institute of Human Relations.

Character Education. By HARRY C. MCKOWN. McGraw-Hill Book Co., Inc., New York, 1935. 477 pages. Price $3.00.

The author has been a Y. M. C. A. director, a high school teacher, for 10 years professor of secondary education in the University of Pittsburg, and he has been in touch on a national scale with youth movements throughout the United States. His previous books have had to do with extra-curricular, assembly and auditorium activities in the school, with school clubs and home room guidance. In this book he discusses what is meant by character, the psychological basis and objectives of character education, direct methods of moral instruction and indirect methods through the activities of the

home, school and church, through personal example and counsel, and considers the influences, good and bad, of organized and unorganized community activities. His book supports very well his hope that it will show the importance and extent of the field. It carries with it practical suggestions likely to be of use to the secular or religious teacher, parents, scout master, clergyman, Sunday school superintendent and all other persons interested in the development of the character of young people. One of these others to whom it can be recommended is the psychiatrist who ventures into the field of child guidance. Dr. McKown has read the psychiatrists and psychologissts and incorporated their views to a noteworthy degree in connection with many other approaches to his problem. The medical man working with the same problem and approaching it possibly too exclusively from a new angle from the study of problem cases and the methods of the consulting room will gain by a fuller knowledge of what others have long been doing and are still doing.

No doubt exists that there is a demand for improved training for ethical living, made more necessary now than ever before by present-day emphasis on personal freedom, combined as it is with release from many traditions and rigid standards of conduct formrly accepted without question, and by new, more highly complex and intricate life situations. This book is written to gather together and appraise the forces working with and against ethical training suited to the times. It is informative, systematic, didactic, and its conclusions are well considered but it is not interesting or entertaining reading unless to the earnest seeker after its facts and points of view.

The Activity Program. By A. Gordon Melvin. Reynal and Hitchcock, New York, 1936. 275 pages. Price $3.50.

In addition to presenting a sound philosophy of progressive education, Melvin deals in detail with the problems of organization of material and teaching method.

The modern school, the author states, centers about *activities* because all learning is through acting. Schools have extremely dynamic material to deal with, in their pupils, and their aim should be "to pick up children on the move and to keep them moving." The activity program finds its origin in the organic life of the school, the pupils' contacts with their environment, with each other, and with activities in progress. Curriculum is not forgotten; the good teacher develops and directs the active life of the child so that it moves into activities involving the subject matter of the curriculum. Then subject matter has a real appeal to the learner, as an aid in the progress of activities in which he is engaged. Such a use of subject matter

necessitates a regrouping of basic facts under new headings, natural realms and activities, such as: transportation, food, colonial industries; the conventional divisions, according to subjects, the author points out, tend to teach segregated facts and so to divide units of experience into separate categories that the unity of the whole is lost to the pupil.

The goal of education is personality. The justification of the progressive school method is not that it teaches more facts and skills, but that it makes for a more efficient mastery of skills, more desirable attitudes, and better personality adjustment.

There are many concrete suggestions to teachers in the book, relative to the beginning, progress and completion of activities, and copious illustrations and examples. It should prove a valuable aid to any teacher interested in the modern school, and a practical and illuminating interpretation of this school and its aims to anyone interested in a more general way in the education and development of children.

Food in Health and Disease. Preparation, Physiological Action and Therapeutic Value. By KATHERINE MITCHELL THOMA, B. A. F. A. Davis Company, Philadelphia, 1934. 370 pages. Prices $3.75 net.

This comprehensive text and reference book on dietetics has had three printings in two years, which indicates the excellent reception accorded it by teachers and practising dietitians. After discussing the normal elements of diets, including a commendable chapter on vitamins, the author next considers the energy requirements of the body in health, and how diets aid in the treatment of disease.

She rightly places emphasis upon the importance in hospitals of the general diet, holding with Dr. Ruth Wheeler, that it is even more important than the individual therapeutic diets prescribed in special cases. The book is notably well balanced with reference to the theoretical and practical parts; there is sufficient space devoted to the physiological requirements of the body for various food elements and practical directions are given for preparation and service.

Chapters are supplemented with lists of questions for review, always of distinct benefit to progressive understanding in the student. The "Laboratory Outlines" provide opportunity for practice, with specific instructions expressed in unmistakable language. This last feature of the book makes it useful to chefs as well as to dietitians. Its service to the latter is manifest.

Buddhist Meditation in the Southern School. Theory and Practice for Westerners. By G. CONSTANT LOUNSBERY. Alfred A. Knopf, New York, 1936. 172 pages, with glossary of Pali terms. Price $2.00 net.

The psychotherapeutic implications of Buddhistic practice have been recognized and commented upon by several keen observers. Jelliffe has been quoted as saying, "There are far more affinities between the Buddhist philosophy and psychoanalysis than exist between the latter and any other system for aiding humanity to attain the goal of increased energy intake, conversion and output."

Miss Lounsbery's book is not an apologia, nor does it attempt to reconcile Buddhism with any western system of thought. It is strictly a text, purposing to instruct the aspirant to *Nibbana* (Nirvana) in the essential technique and methods of *Bhavana* (Buddhist meditation), which the author warns us is not to be confused with *Hatha Yoga*, practised by the Hindu fakirs. On page 76, she states: "Yoka is undoubtedly a science which permits one to obtain an unusual control of body and mind. Buddhists consider many Yogic practices to be exaggerated, incompatible with the middle path which avoids extremes." Yoga, it is known, operates through a condition of autohypnosis making possible a remarkable regulation, though incomplete, of some fundamental physiological functions that are otherwise inaccessible to the will. The self-absorption of *Bhavana*, on the other hand, is directed toward psychic functioning.

The profound insight that the Orientals have into emotional life has long been acknowledged. Buddhistic practice strives especially to eliminate affect from thought. One writer has said: "*Dukkha* . . . refers not only to sorrow as consisting of the ills, trials and tribulations of everyday life, but it refers almost entirely to the emotion that arises upon appreciating the impermanency and transiency of life, and all else in the universe." And further, "This is precisely one of the principal symptoms of many neurotics —the feeling of the futility of future efforts, the emptiness of life; it appears in many disguises." The attainment of the perfect state of tranquility, *Nibbana*, is accomplished by a general ascetic training which consists in a systematic suppression of all emotional life, aiming at the obliteration of feelings of frustration.

One notes particularly, on page 81, the strong penchant which the conscientious Buddhist has for sublimation. It is written: "To rout out and banish any one of these mental states (craving, ill will, restless brooding etc.), Bhikkhu Silacara's advice is to concentrate upon a thought directly contrary to it rather than to fight against it. If a thought of ill will arises,

think of benevolence.'' Given true insight, this would be excellent mental hygiene practice, but how many times is this not the pathway to a reaction formation?

At least in one of its basic principles, Buddhistic thought can be demonstrated as analogous to Freudian psychopathology. According to Buddha Gotama, *tanha* (desire) is the outstanding obstacle to wisdom. In making the comparison, one writer has said, ''This, restated in the language of psychoanalysis reads: 'uncontrolled desire, faultily attached libido, is the salient etiological factor in the neuroses.' '' Even the methods bear some resemblance to one another. *Bhavana*, under its optimum condition, creates a situation rather like free association. Miss Lounsbery's exposition of the method is lucid, pointed and brief enough for general purposes. Especially in Part II, on ''Practice,'' she avoids wordiness and makes quite understandable the purposes behind the ''preparation,'' with its suggestions for posture and breathing exercisses.

Considering the tempo of western civilization, it seems unlikely that *Bhavana* could be utilized here to any great extent. However, the mental therapist must have, among other talents, an open mind. It would be folly to say that philosophy and metaphysics have nothing to teach psychiatry, inasmuch as the stuff of mental experience has been so interwoven with those two disciplines. The book is recommended, then, to psychiatrists who would acquire or maintain the broader viewpoint.

CHARLES SHERMAN LITTLE

A distinguished personality passed from the ranks of American psychiatry with the death, on June 6, 1936, of Dr. Charles Sherman Little, who had been superintendent of Letchworth Village since its inception in 1910.

Dr. Little was born at Webster, N. H., on February 12, 1869. Following an active college career at Dartmouth, marked by notable achievements in athletics, he was a civil engineer for two years, returning to Dartmouth to receive a medical degree in 1896. His alma mater further honored him when, in 1933, it conferred upon him the degree of Doctor of Science. Dr. Little carved out the earlier part of his career in New England. He served at the McLean Hospital and the Taunton and Tewksbury state hospitals, in Massachusetts. Prior to coming to Letchworth Village, he was superintendent of the State School for the Feebleminded at Laconia, N. H.

It should be a source of gratification to the profession that appropriate tribute was paid to Dr. Little before his crossing of the bar. The celebration of his twenty-fifth anniversary as executive of Letchworth last July prompted felicitations from friends and admirers the nation over. Not many months ago, this journal pointed out, on the death of George Hughes Kirby, that his fitting monument was the great institution which he had directed. Here again, we may say that an enviable memorial exists in the institution that was conceived, built, and guided over a quarter-century by Dr. Little. Far transcending mere brick and mortar are the years of devotion to bettering the lot of the mentally handicapped.

NOTES

—The first international congress of sanatoria and private nursing homes will be held in Budapest at the end of September, this year. Special invitations will be sent in due course to all parties concerned. The short extract of lectures, discussions, proposals, and other material, should be sent to the following address as early as possible in order that they may be included in the official program: Committee of the First International Congress of Sanatoria and Private Nursing Homes, Budapest, Margitsziget, Sanatorium, Hungary.

—The ninety-second annual meeting of the American Psychiatric Association was held early in May, in St. Louis. A most instructive and interesting program was presented, reflecting the increasing activity in the various fields of study. Dr. C. Macfie Campbell was inducted into the office of president of this society, which is close to rounding out a century of service in the cause of humane and intelligent treatment of the mentally disordered. Respect was paid to Professor Freud in his eighty-first year.

—On June 15, 1936, the governors of the Society of the New York Hospital announced that the name of the Bloomingdale Hospital at White Plains, N. Y., has been changed to: New York Hospital—Westchester Division. The change was made in order to convey a clearer understanding of the relation of this hospital to the society by which it has been conducted since it was established in 1821. On the same date the governors formally announced the induction of Dr. Clarence O. Cheney as medical director of the hospital.

—Annual interhospital conferences were held during the first half of April, at the Utica State Hospital and the Psychiatric Institute. Physicians and social workers from all of the department institutions in the up-State and down-State areas combined their efforts in a symposium on "Clinic Activities of the New York State Department of Mental Hygiene." From the content of the papers read, and the discussion upon them, the general feeling was elicited that there is increased need for extending mental hygiene facilities into the community; also, that the prospect for such expansion is encouraging in view of the splendid cooperation that has been experienced in contacts with various community agencies. Dr. Clarence O. Cheney, who presided at both conferences, emphasized the preventive prin-

ciple behind clinic activity, explaining how assisting the patient to make mental adjustments frequently obviates commitment to an institution. Some of the papers that were submitted appear in the concurrent number of the QUARTERLY SUPPLEMENT.

—One hundred and fifteen representatives from 41 schools of medicine of the universities in the United States and Canada attended the fourth conference on psychiatric education, held at the Henry Phipps Psychiatric Clinic of Johns Hopkins University, in Baltimore, on April 8, 9 and 10. The conference was called by the Division of Psychiatric Education of The National Committee for Mental Hygiene. Dr. Adolf Meyer presided.

The plan of the conference was to consider the undergraduate training of medical students, concerning itself with a discussion of what constitutes this year's training plans in the medical schools represented and, moreover, what instruction the medical student might expect as a preparation for hospital interneship and practice.

The program was devoted to reports of samples of teaching in the various medical schools and demonstrations at the Johns Hopkins University School of Medicine; to a discussion of the specific range and content emphasized in the courses and teaching concerned with the organic psychoses, the toxic-infectious disorders, the essential psychoses and the psychoneuroses; the special procedures in connection with dispensary, general ward and special ward teaching, autopsy data, and general mental health work; to a discussion of the types of principles in psychopathology and psychotherapy, and, lastly, to a discussion of the general preparation in the basic sciences.